



# CHANNEL

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## C. & I. S. Wins IBM Grant on the Management of Information Systems

In April, the UCLA Graduate School of Management was chosen as one of thirteen business schools throughout the U.S. to receive a \$2 million grant from IBM — \$1 million worth of equipment and \$1 million for support of faculty, student, and staff. The other winners in this competition were **Arizona, Claremont, Georgia, Georgia State, Indiana, Illinois, Minnesota, M.I.T., Pennsylvania, Pittsburgh, Rochester, and Texas.** The Co-Principal Investigators for GSM are **Jason Frand**, Director of GSM Computing Services and an Adjunct Assistant Professor in the C. & I.S. area; **Michael Granfield**, Associate Dean and Chairman of the School; and **Ephraim McLean**, Director of the C. & I.S. Research Program.

The UCLA effort, named **MISSLE**, for Management of Information Systems Support Learning Environment, is aimed at addressing the information systems needs of both the end user and the IS professional. For the first group, the Management Information Center (MIC) is to be established under the direction of Professor Ephraim McLean. Examples of the type of research to be conducted in this Center are topics such as the relative advantages of *integrated* microcomputer software (e.g., Symphony, Framework) compared to *interfacing* software (e.g., TopView, Windows); the management problems of supplying and supporting multiple brands of the same type of software; establishing and enforcing software standards; and the technical problems of acquiring, installing, maintaining, and providing access to remote, large-scale data bases.

The Center will also contain video projection equipment, which will allow students and instructors to display the contents of their individual screens so that an entire class can see and share results simultaneously. In this way, experiments in group decision-making and team-based decision support systems (DSS) can be undertaken. **Dr. Martin Greenberger** will build on his current work in the publishing industry exploring the use of high-resolution color-projection equipment and the innovative combination of computer and projection technology.

As a result of these investigations, a two-level benefit is anticipated. First, a large number of UCLA M.B.A.s in a

broad range of disciplines will use the Center and experience an enhanced exposure to computing, thus better preparing them for their subsequent careers in business and management. Second, the very process of providing these computing services will yield improved insight into the management of end-user computing which, in turn, will be incorporated into the C. & I.S. curriculum for those M.B.A.s specializing in the management of information systems.

The other half of the **MISSLE** project, the Advanced Development Center (ADC), is headed by **Professor Clay Sprowls** and is dedicated to the IS professional's computing needs. It will include a network of IBM PC/AT machines plus AT/370 and 3270-PC AT/G microcomputers. Development work, starting in the Summer of 1985, is supported by GSM doctoral students **Hyung-Min Chung** and **Gordon Wong**, and second-year M.B.A. student **John Bloom**. Summer efforts have been directed primarily toward developing support for Fall and Winter Quarter courses.

The effects of the ADC will be felt immediately in the new curriculum. Students enrolled in Fall and Winter Quarter offerings of Mgt. 224C, Systems Analysis and Design, will be able to use three separate but linked systems for term projects: **Excelerator** (from Index Technology) for structured analysis; **ADAPT** (from Techni-Kit Builders) to translate the

**Excelerator Dictionary** into PSL/PSA; and PSL/PSA (from ISDOS, Inc) for system requirements checking, analyses, and reports.

Doctoral students enrolled in Mgt. 224G, a Special Topics course on Expert Systems, offered in the Fall Quarter by Visiting Lecturer **Dr. Kamran Parsaye**, will be able to use the ADC as a laboratory to study expert systems with **Experteach** (Intelliware, Inc.) that includes expert system shells as well as LISP and Prolog interpreters.

Finally, for the Mgt. 224D course on Data Base Management Systems that is offered in both Winter and Spring Quarters, students will have a variety of microcomputer DBMSs available as well as access to a mainframe DBMS for study and use in data base projects. The selection of the DBMS to be included in the ADC is under way.







## Winter Associates Meeting: Focus on Research

The mild Southern California winter seems to have inspired a flood of research activities, which was the key word at the Winter Associates meeting. The C. & I.S. Associates convened for their Winter Meeting on Friday, March 15, 1985, to discuss the new and current research proposals under development at GSM, and to strengthen the links between the research needs of business and the academic research of the C. & I.S. faculty and doctoral students. The following faculty and doctoral students gave short presentations on their work.

- Sprowls** Systems analysis and design data base management systems, with emphasis on relational DBMSs
- Markus** Electronic communication media in organizations
- Swanson** Comparative maintenance environments of moderate-to-large-size information systems
- Greenberger** The future of in-house videotex
- McLean** Measuring the value of IS
- Wong** Successful computer use in developing countries
- Beath** Strategic information systems in support of pricing decisions
- Salaway** Methods of improving user/analyst interactions
- Chari** Knowledge representation using structured modeling
- Wu** Information systems quality assurance
- Hsiao** The generation of computer-based fuzzy information

After the business portion of the meeting, guest speaker **J. Daniel Couger**, Distinguished Professor of Management at the University of Colorado, Colorado Springs, presented a lecture on the "Motivation of Maintenance Personnel." Dr. Couger's presentation examined his national data base of 6000 persons involved in the maintenance of existing computer systems. He presented evidence that the motivating potential of this maintenance work is significantly less than that of new development work. He then went on to describe a model he had developed based upon the experience of ten organizations where maintenance productivity and programmer motivation is just as high as that which occurs in new application development. With this model, Dr. Couger described a set of generic procedures that are useful in improving the process of application maintenance.



## Spring Associates Meeting: T. Capers Jones Speaks

The May 30th Spring Meeting of the C. & I.S. Associates opened with the traditional luncheon at the GSM Executive Dining Room. This was followed by a closed-session discussion of the C. & I.S. curriculum.

The discussion of the current structure of the M.B.A. program in C. & I.S. uncovered a feeling that the beginning courses suffer from the need to serve two basically different types of students who attend GSM. On the one hand there is the typical student, say, an Accounting or a Finance major, who takes an introductory course in C. & I.S. to broaden his or her experience but who has no interest in going any further. The second type of student is sincerely interested in the IS field and wants to use the beginning course as a solid basis for subsequent work in information systems. The question is how best to serve the needs of both of these groups.

The two beginning courses, MGT 404 (Managerial Computing) and MGT 225A (Information Systems), were examined and the discussions which ensued dealt with the issues of computer technology and terminology; hardware and software; languages, both procedural (e.g., COBOL) and nonprocedural (e.g., Lotus 1-2-3); system development technologies; hands-on experience; use of case studies; and so forth. The results of these discussions are to be reflected in the classes offered to the incoming M.B.A. students in the Fall of 1985.

Following the discussion of curriculum, **T. Capers Jones** was introduced as the guest lecturer for the Spring 1985 Associates Meeting. Capers Jones, co-chairman & co-founder of Software Productivity Research, Inc., made a presentation on "Program Quality and Programming Productivity: A Survey of State of the Art." His observations, based on data from some 200 companies and 3000 projects, were collected from 1968 through the beginning of 1985.

Mr. Jones said that, in major corporations, software has become a major problem. He pointed out that in high-tech companies, data processing workers are the second or third largest group of workers; in the banking and insurance industries, they are the largest group. By the end of the century, he predicted that information workers will become the third or fourth largest group of employees in the world — or in human history, exceeded only by agricultural workers in India and civil service workers in China.

He divided IS development problems into several components: systems, schedules, bugs, and productivity. Productivity declines as systems get larger. He cautioned against systems which are arbitrarily forced into an 18 month schedule. In many instances, the delivery date is set and the rest of the system life cycle is determined by working backwards from this date. Often, however, the system cannot be created in this time period; and shortcuts at the beginning of the life cycle result in tremendous problems later.



The main reason that software production is so time consuming is because of bugs. Few companies measure software quality but of those who do, the median number of defects is 50-60 bugs per 1000 lines of codes (LOC). Problems can also be caused by errors in the requirements, design, and documentation of the system or from "bad fixes" of earlier problems. Other reasons for the wide variations in quality and productivity within a given sized project are human variance, the novelty or complexity of the project, structured versus unstructured code, organizational variances, the degree of centralization, the existence of task forces, matrix versus hierarchical management, the goals and direction set by management, and the tools and support systems.

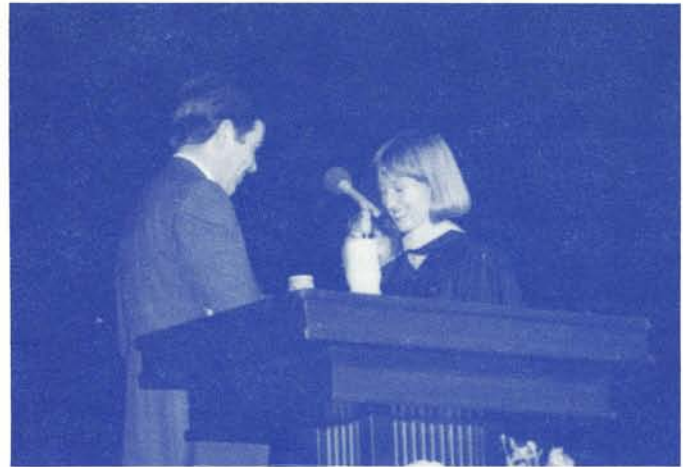
In small systems, defect removal and coding are the top expense elements; but for large systems, paperwork is the second most expensive element. Over 200 pages of paperwork are required per 1000 LOC in a medium-to-large system. The total written specifications for 1 million lines of code exceeds the lifetime reading capacity of the average student reading every day from age 27 to death (which would probably occur, under these circumstances, at age 30!).

Mr. Jones concluded that the best way to improve productivity is to lower defect levels. Defects may be prevented by structured design and coding and by the use of high level languages. Standard functions will also be important in the future in order to make use of system redundancy. By 1990, reusable modules could reduce development time for large systems from 24 to 6 months and greatly improve defect removal efficiency and thus productivity.

## 1985 MIS Night Scheduled for October 23rd

MIS Career Night, the annual meeting of information systems executives and students interested in MIS opportunities, will be presented by the Association of Students and Business and the C. & I.S. area once again at the Faculty Center on Wednesday, October 23, 1985, from 4:30 - 7:00 p.m. ASB has recruited noted keynote speaker **Victor Millar**, National Managing Partner for Practice of Arthur Andersen, one of the leading accounting and consulting firms in the country. Among other things, Mr. Millar is known for his work in information systems and is the co-author, with Michael Porter of Harvard, of "How Information Gives You Competitive Advantage" which appeared in the July-August 1985 issue of the *Harvard Business Review*.

Following the ASB portion of the program, the C. & I.S. Associates are invited to the Sunset Canyon Recreation Center for a dinner meeting and to become reacquainted after the summer.



*Charles Tucker, Senior Vice President of First Interstate Service Co. and this year's C. & I.S. Associate Chairman, presents the award to **Ida Harding**, one of the two co-winners.*

## Ida Harding and Jane Cordingly Share 1985 C. & I. S. Associates Award

In a split decision, second year M.B.A. students **Ida Harding** and **Jane Cordingly** were co-recipients of the 1985 C. & I.S. Associates award. This award is usually given at graduation to the 2nd year student who has shown the most outstanding work in the C. & I.S. area; but this year the award was split to recognize the significant contributions of both Ida and Jane, who were co-founders of the MIS club.

A native of Georgia, **Ida Harding** received her B.A. in Education at Georgia State University. She then went on to the University of Wisconsin where she earned an M.A. in English Literature and Linguistics. While working on her Ph.D. at the University of Wisconsin in post-secondary reading and learning skills and working as Director of the Academic Skills Center, Ida decided to shift her attention and concentrate on her organizational and business skills, deciding to pursue an M.B.A. at UCLA. Her career at GSM was distinguished by her service as Director of the 1984 MIS Firm Night and an outstanding student record. Ida plans to continue her career with a position at IBM.

**Jane Cordingly** received her B.S. in Cardiorespiratory Sciences from the State University of New York at Stonybrook and has been a Registered Respiratory Therapist since 1979. Before coming to GSM, Jane was Director of Gwynedd Mercy College's Respiratory Therapy Program, which she designed and implemented. She also established the position of Public Relations Coordinator for Respiratory Therapy in Southeastern Pennsylvania and was active in the development of the Pennsylvania Association of Respiratory Therapy Educators. While at GSM, Jane double-majored in MIS and Marketing, was President and Co-Founder of the MIS Club, and Co-Editor of *The Exchange*, the student newspaper.

**Charles C. Tucker**, Senior Vice President of First Interstate Services Company, and this year's C. & I.S. Associates Chairman, was on hand to present the awards to the winners.



## Faculty Happenings

In February, **Professor M. Lynne Markus** chaired a session and presented a paper on "Office Automation Needs Assessment for Managerial and Professional Workers" at the Office Automation Conference in Atlanta. She also spoke on "The Bugs and Features of Office Automation" at a program in March, jointly sponsored by The University of Tulsa and the Tulsa Chapter of the Association for Systems Management. In May, she spoke on "The Organizational Politics Perspective on Communication Technology" at the International Communication Association Conference in Honolulu.

**Professor E. Burton Swanson** and **Cynthia M. Beath**, a C. & I.S. doctoral student, are presently completing a set of twelve cases on application system maintenance as part of a research project begun in 1983. Assisting them during the past year were **Amy H. Sand** and **Patricia C. Plessinger**, both GSM M.B.A. students. The focus of the study has been on comparative maintenance environments of moderate-to-large-size information systems organization, and on alternative IS management strategies for maintenance of the application system portfolio, including alternative approaches to organization design, task definition and assignment, work technique, and policies for coordination and control.

**Dr. Jason L. Frand**, recently appointed as an Adjunct Assistant Professor in C. & I.S., spent the Spring visiting a number of campuses as part of his study of business school computing and its impact on management education. He visited Wharton, Columbia, Duke, University of Michigan, and the University of Rochester for in-depth interviews and observations.

He also participated in a panel on "Symposium on Implementing Information Technology in Business Schools" at the Twenty-Sixth Annual Meeting of the Western Academy of Management in San Diego in March; he chaired a two-day workshop on "Computers in the M.B.A. Program: Challenges, and Alternatives" for business school computing services directors and managers for the California Educational Computing Consortium, also in March; and he participated in a panel discussion on "Computer Software Development, Distribution, and Licensing" at the 1985 AACSB Annual Meeting in Orlando, Florida, in April.

**Professor Ephraim R. McLean**, has had a very busy Spring. In January, he and **Jay Nunamaker** and **Richard O. Mason** of the University of Arizona hosted an AACSB-sponsored program entitled "MIS and the Business School: A Strategic Look at Curriculum and Faculty Development." The meeting, aimed at business school deans, attracted a large turnout; it was held in Tucson, Arizona.

In March and again in June, Professor McLean gave day-long presentations on "MIS Planning" to managers attending IBM's Manufacturing Technology Institute in New York City. On his way home from the March IBM presentation, he swung by the annual three-day meeting of Institutional Members of the Society for Information Management in Tampa, Florida. At the end of March, he joined Jason Frand at the annual Spring meeting of the California Educational Computing Consortium held at the University of California at Santa Cruz.

In April, the Advisory Council of the International Conference on Information Systems held their annual Spring meeting at the Hotel del Coronado in San Diego. Professor

McLean chaired the meeting and Lynne Markus and Burton Swanson also attended from UCLA. Finally, in June, he and **Dr. Lewis E. Leeburg**, on leave from IBM and a newly appointed Visiting Associate Professor in C. & I.S., attended a three-day conference in St. Louis on Enterprisewide Information Management, co-sponsored by IBM's Scientific Center in Los Angeles and Washington University in St. Louis.

## Update on Research

### The C. & I. S. Colloquium Series

The C. & I.S. Colloquium Series consists of biweekly invited presentations of research and state-of-the-art developments in the C. & I.S. field. Speakers include leading scholars and practitioners from around the country. Attendance is open to both the campus and off-campus community. The following presentations were made during 1984-85.

*October 25, 1984.* **Joyce J. Elam**, Graduate School of Business, University of Texas at Austin. "An Optimization-Based Decision Support System for Integrated Logistics Planning."

*November 8, 1984.* **John A. Zachman**, IBM Western Region, "A Framework for Information Systems Architecture."

*December 6, 1984.* **Mary J. Culnan**, School of Library and Information Studies, University of California, Berkeley. "Mapping the Intellectual Structure of Academic Disciplines: The Case of MIS."

*January 17, 1985.* **Rob Jaffe**, IBM Research Division, Yorktown Heights, New York. "Industrial Machine Vision."

*February 14, 1985.* **Robert Neches**, Information Scientist, Information Sciences Institute. "Toward a User-Friendly Computer Environment."

*March 7, 1985.* **Mark S. Silver**, Department of Decision Sciences, The Wharton School. "Differential Analysis for Computer-Based Decision Support."

*March 14, 1985.* **Richard L. Daft**, Department of Management, Texas A & M University. "The Relationship Between Message Content and Media Selection in Managerial Communications: Some Preliminary Evidence."

*April 11, 1985.* **Daniel Robey**, Florida International University. "Organizational Impacts of Information Systems: Conceptual Models and a Field Experiment."

*April 18, 1985.* **Niels Bjorn-Andersen**, Copenhagen School of Economics, Copenhagen, Denmark. "A Scandinavian Model for the Office of the Future."

*May 9, 1985.* **Richard Boland**, University of Illinois at Urbana-Champaign. "The Micro Dynamics of a Budget-Cutting Process: Modes, Models and Structures."

*May 23, 1985.* **James L. McKenney**, Graduate School of Business Administration, Harvard University. "The Influence of Computer-Based Communication on the Organization."

*June 6, 1985.* **William H. DeLone**, Division of Business, College of the Virgin Islands. "Determinants of Success for Small Business Computer Systems."



## Results of the 2nd Annual Survey of Business Schools

Over the summer, **Jason L. Frand** and **Ephraim R. McLean** completed the *2nd Annual UCLA Survey of Business School Computer Usage*. This report presents information about the current state of computing in 125 AACSB-accredited business schools along the dimensions of computing resources, levels of support, and the penetration of computers into the curriculum.

The overall picture presented by the data suggests that the use of computing is extensive and that schools are allocating considerable resources in this area. Eighty-one of the schools reported having their own in-house computing facilities, with 39 of these containing minicomputer systems and the balance continuing a collection of terminals, microcomputers, and computing staff personnel.

In the matter of financial support, the data indicate that approximately three percent of each school's budget is currently spent on computing. On a per-student basis, the computing expenditures range from a high of \$444/student for the median school in the top quartile to a low of \$18/student for the median school in the bottom quartile.

The most dramatic development seen in this survey is the expanded use of microcomputers, with 95 percent of the schools indicating that they now have at least one brand of microcomputers available for their students and faculty, and two-thirds reporting two or more different makes available. The density of coverage, however, is highly variable. The median school in the top quartile provides one micro for every 16 students, while the median school in the bottom quartile provides only one micro for every 162 students. The computer staff/student ratio similarly varies from one staff FTE for every 90 students to one staff FTE for every 1820 students.

Eighty-six percent of the schools reported having some mechanism for supporting computer-related curriculum development by faculty. Future surveys will attempt to gather details on the nature of computer usage in various functional areas, and the adequacy of hardware, software, and support for this usage. For a copy of the full report, write to the Computers & Information Systems Research Program, Graduate School of Management, University of California, Los Angeles, CA 90024; or phone (213) 825-2502.

### Courses for IS Executives to be Offered at UCLA

In the last few years, the use of computer-based technologies has had a profound impact on the way organizations are being managed. Companies are now seeing a deluge of these technologies being hurled at them. For many organizations, the explosive growth in office automation, personal computers, robotics, CAD/CAM, decision support systems, and telecommunications among others, will produce no more than marginally productive results. For other companies, these developments will strategically reposition them for the decade ahead. How these information resources are to be managed is no longer a concern for the DP manager alone.

Today, senior information services management is being called upon by top management to provide functional executive leadership. Called variously, Information Resource

Manager," "Director of Information Services," or "Chief Information Officer," these computer functional executives and their staffs recognize that they must "rechart" IS's mission and role to provide the needed leadership to their organizations. "Recharting" involves learning how to manage the four major issues which information services organizations now face:

1. **Managing the Existing Applications Portfolio as an Asset.** Often 90 percent of the information services resources of a business are already committed to support *existing* systems, each in various stages of their life cycles.
2. **Managing the Diversifying Technologies.** Conventional management approaches for the emerging technologies often lead to confusion and frustration; new approaches and fresh insights are needed.
3. **Building the Computer Architectural Bridge.** Linkages among the technological "Towers of Babel" which are emerging must be established in order to provide a well-defined blueprint for growth.
4. **Providing Executive Leadership.** Organizational and procedural mechanisms to link the business and computer strategies are essential.

None of these issues have clear, precise answers. It is estimated that many organizations will expand their use of computer-based technologies seven-fold in the coming decade. Therefore, they must begin now to rechart IS in order to handle these new opportunities and responsibilities.

In recognition of the growing importance of the information services function, the UCLA Graduate School of Management joins with the firm of Nolan, Norton & Co. in announcing the program, **Managing the Information Resource**. It will be offered twice during the coming year, on **November 10-15, 1985**, and **April 13-18, 1986**.

As with previous offerings, this program will be an intensive five-and-one-half-day residential conference designed to prepare managers for successfully dealing with the information services challenge of the '80s. It combines discussions of leading-edge techniques for IS management with problem-solving analyses of real company situations. Active classroom discussion is also stressed, with the exchange of professional experiences by participants and faculty a vital aspect of the course.

All classes will be held in the Executive Classroom of the Graduate School of Management. The program headquarters will be the elegant Westwood Plaza Hotel, located within walking distance of the UCLA campus. A block of rooms will be reserved at the hotel for those attendees who required accommodations. The cost of the program, including all materials, lunches, breaks, and a reception at the end of each day of classes, is \$1950.

The program will be led by **Dr. Richard L. Nolan**, whose successful *Stage Approach to EDP Growth* provides a powerful and comprehensive perspective for understanding and managing the information resource. Joining Dr. Nolan as co-leader will be **Dr. Ephraim R. McLean**, of the Computers and Information Systems faculty and a long-time consultant in the information systems field. They will be assisted by other members of the UCLA faculty and by members of the consulting staff of Nolan, Norton & Co. Taken together, these experts represent well over half a century of experience in the computer field.



## Working Paper Series

The Information Systems Working Paper Series is a major publication of the C. & I.S. Research Program. The following titles were published in the 1985 series, and are available to the public at a nominal fee.

1-85, **Jason L. Frand**, "Computer Literacy for General Management," September 1984.

2-85, **E. Burton Swanson, Chung-Fern Wu, and Thomas Gosnell**, "Software Maintenance References," March 1984.

3-85, **Gail Salaway**, "An Organizational Learning Approach to Information Systems Development," April 1985.

4-85, **Brian Hsiao**, "A Fuzzy Set View Of Semantic Information," May 1985.

5-85, **E. R. McLean**, "The Current State of Strategic Planning for Information Systems," June 1985.

6-85, **E. Burton Swanson**, "Information Systems: Necessary Foundations," June 1985.

7-85, **E. R. McLean and Stuart Sinclair**, "Information Systems and Competitive Strategy: The Why and the How," June 1985.

A comprehensive list of available working papers and reprints is contained in *Information Systems: Publications and Working Papers*, published by the C. & I.S. Research Program and updated annually.

## Recent Publications

Recent related publications by C. & I.S. faculty include the following books and articles.

**Greenberger, Martin, and Hogan, William W.**, "Energy-Policy Modelling in the USA: Competing Societal Alternatives," *The Politics of Energy Forecasting*, Thomas Baumgartner and Atle Midttrum (Eds.), Oxford University Press, 1986.

**Baker, Vicki F., and Markus, M. Lynne**, "Understanding Managerial and Professional Office Automation Preferences," *AFIPS: Office Automation Conference*, Atlanta, GA, 1985, pp. 141-148.

**Greenberger, Martin**, "The Post-Print Society," Congressional Copyright and Technology Symposium, Committee Print, U.S. Copyright Office, Library of Congress, Washington, D.C., 1985.

**Harel, E., and McLean, E. R.**, "The Effects of Using a Nonprocedural Computer Language on Programmer Productivity," *MIS Quarterly*, June 1985, pp. 109-120.

**Swanson, E. B.**, "A Note on Information Attributes," *Journal of Management Information Systems*, (forthcoming).

**McLean, E. R.**, "The Current State of Strategic Planning for Information Systems," *EDP Analyzer*, July 1985, pp. 13-14.

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*This newsletter represents our continuing efforts 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, Director, Computers and Information Systems Research Program; Michael Sachs, Newsletter Editor.*

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