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Increasing Productivity in Information Systems Development

By James C. Wetherbe



James C. Wetherbe

There are two major problems with the way in which we currently develop information systems—it takes too long and we never get the right system the first time.

Taking too long frustrates users, delays the benefits of the system, and hurts the credibility of the information systems function.

Not getting the right system the first time results in expensive, time consuming rework of a system. The major reason we do not get the right system is we try to define information requirements by asking managers what their information requirements are. Unfortunately, managers have difficulty defining their information requirements purely by such analysis. That is why once they start to use the system they begin to learn and ask for what they really need. This has led to the systems development cliché—"What users ask for is not what they want; what they want is not what they need."

Even though it virtually always results in major reworks, we continue to develop systems as if users can tell us what they need through traditional systems analysis.

The MIS Research Center and the University of Minnesota work in conjunction with 20 major corporations headquartered in the Twin Cities on information systems research issues of common interest. The current number one issue is improving information systems development productivity such that the time between user requests and properly responding to them is decreased. Some positive results are coming out of these efforts using advanced

Continued—page 8

UNIVERSITY PUBLICATIONS MORATORIUM LIFTED

The *Minnesota Management Review* was not published during the winter and spring quarters of 1982 due to a moratorium on recurring periodical publications, issued by University president C. Peter Magrath on January 8.

The moratorium was imposed to help the University cope with the loss of some \$20.7 million in appropriations for the biennium 1981-83 from the Minnesota State Legislature, which was necessitated by the severe budget deficits of the state.

In his January 8th announcement, President Magrath said that he wished to "shield the academic programs of the University to the maximum extent possible" from the budget cuts, and the ban on publications was part of a plan to cut total University spending.

At the end of the spring quarter the moratorium was lifted, making way for the return of the *Minnesota Management Review*. □

VAN de VEN NAMED TO 3M CHAIR



Andrew H. Van de Ven

Professor Andrew H. Van de Ven has been named to the 3M chair in human systems management at the University of Minnesota School of Management.

Van de Ven's research has focused on assessing organization design and performance, organizational problem solving and innovation, group meeting process and inter-organizational relationships. Findings of this research have been published in numerous professional journals and several professional books including, *Group Techniques for Program Planning* (Scott-Foresman, 1975), *Measuring and Assessing Organizations* (John Wiley and Sons, 1981).

Continued—page 3

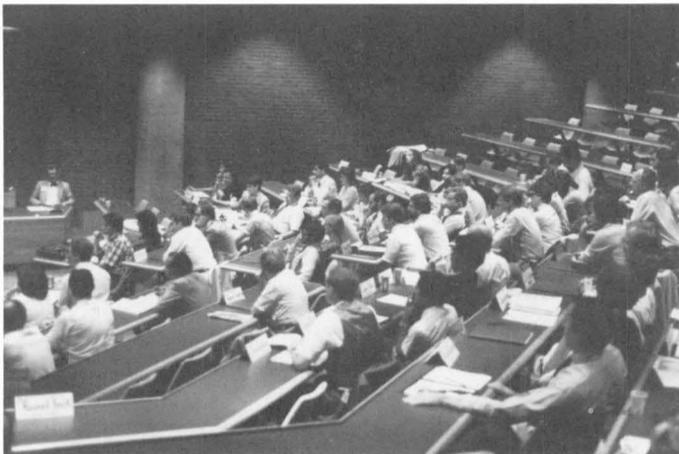
Contents

Minnesota Hosts Marketing Consortium	2
Grants Support Faculty	2
Roering Elected VP of American Marketing Association	2
Elmer Andersen	
Receives Honorary Degree "Competitive Edge"	3
Scholarships Made Available	3
Executive Development Center Names New Director	3
Research Update	4

The Why and How of Continuing Professional Education	5
Faculty on the Move	6
Undergraduate Program Advisory Board	6
CHART Scholarships	6
Managers' MBA	7
Annual Giving Program Sets Record	7
Alumni Advisory Council Highlights	9
Alumni Profiles	10
Alumni Update	11
1982-83 Executive Development Center Programs	12

Minnesota Hosts Marketing Consortium

The University of Minnesota School of Management hosted the 1982 American Marketing Association Doctoral Consortium from July 28 through August 1. Sixty Ph.D. candidates designated as the top marketing students at their respective universities received four days of intense instruction from 40 of the world's most highly regarded marketing faculty.



Marketing Doctoral Consortium

This unique program is designed to stimulate research on significant marketing issues, ensure that prospective marketing academicians are exposed to a variety of viewpoints, and facilitate meaningful interaction among consortium fellows and leading marketing academicians.

Co-directors of the Consortium were School of Management faculty members Kenneth J. Roering, professor and chairman, marketing department; Eric Berkowitz, associate professor of marketing; and Ivan Ross, professor of marketing.

Speakers included not only outstanding faculty from the United States and Canada, but also business leaders Lewis W. Lehr, chairman and chief executive officer, 3M; John M. Stafford, executive vice president, Pillsbury Co.; DeWalt Ankeny, vice chairman of First Bank System; and William Andres, chief executive officer, Dayton Hudson Corporation. □



Professor Richard K. Gaumnitz, MBA commencement speaker in June, retired this year after 40 years with the School of Management.

Grants Support Faculty

Grants totaling \$750,000 from Burlington Northern, Gelco Corporation, General Mills, and Investors Diversified Services (IDS) will provide support to the School of Management's most productive faculty.

Professorships and fellowships provided by the grants will help alleviate some of the problems that have been created in the faculty salary structure over the past three years, according to David M. Lilly, dean of the School. In order to compete in a tight market where there are eight to 12 positions for every available candidate, the School has hired newer faculty at compensation levels often exceeding those of members of the existing faculty.

These grants will help the School provide incentive money to reward productive faculty, deal with salary compression and provide compensation that is in line with competing schools of management, Lilly said.

"Our initial goals, including the hiring of 35 new faculty over the past three years, have been met," Lilly said. "Now we must concentrate on retaining, recognizing and rewarding the outstanding faculty we have assembled. These grants will help greatly in that process and represent a major investment in high quality management education at the University of Minnesota." □

Roering Elected Vice President of American Marketing Association



Kenneth J. Roering

Professor Kenneth J. Roering, chairman of the Marketing Department at the University of Minnesota School of Management, was elected vice president of the 40,000 member American Marketing Association. His term of office extends from July 1, 1982—June 30, 1984.

Roering's responsibilities include the development and coordination of all AMA efforts designed to advance the science and practice of marketing as well as the AMA's efforts to enhance the professional development of the 2,500 marketing academicians in the U.S. and Canada. In addition, his responsibilities include a three-year term on the AMA Board of Directors and the AMA Executive Council.

Roering has been actively involved with various professional associations and is recognized as one of the country's leading marketing educators. He has published more than 30 scholarly articles and written or edited four books. He currently serves on the editorial boards of the *Journal of Marketing* and the *Journal of Marketing Research*—two of the most prestigious journals in the field. He has been actively involved in consulting and executive education with both product and service-oriented firms throughout the United States, as well as South America, Canada and Mexico. □

Elmer Andersen Receives Honorary Degree

Former Minnesota Governor Elmer L. Andersen received an honorary doctor of management degree from the School of Management at the June 13, 1982 commencement ceremony.

Andersen, who was governor from 1961 to 1963, is the 60th person to receive an honorary degree from the University of Minnesota since the award was first given in 1925 and is the first to receive such a degree from the School of Management (formerly the College and Graduate School of Business Administration).

He received a bachelor's degree in business administration from the University of Minnesota in 1931 and went on to make outstanding contributions to the state's political, economic, educational and civic affairs. Andersen is currently chairman of the board of H.B. Fuller Company. □



Wells J. Wright retired from the University of Minnesota after 42 years of service to the Business Law Department. L to R: Dean David Lilly, Wells Wright, (standing) Professor Kenneth Roering, Mrs. Wright, and Associate Dean Edward Foster.

Competitive Edge Scholarships Made Available

Corporate Report Minnesota, the *Minnesota Business Journal* and the University of Minnesota School of Management will cosponsor four Competitive Edge, 80-percent scholarships each year to the Minnesota Management Institute. The scholarships are designed to meet the needs of small, rapidly growing companies for more sophisticated management skills to support the technical side of their businesses.

The Minnesota Management Institute is an advanced, four-week residential program offered by the Executive Development Center of the School of Management. Subjects covered include management policy and control, finance operations, marketing, management information systems, and stresses practical solutions to problems faced by growing companies—large and small. □

Executive Development Center Names New Director

Professor Norman L. Chervany has been appointed director of the Executive Development Center at the School of Management.

A professor of quantitative analysis and management information systems, Chervany left his post as chairman of the Management Sciences Department at the School of Management in July to assume his new duties.

“There are many exciting challenges and opportunities facing executive education,” said Chervany. “I’m excited about the opportunity to assume direction and leadership of the School of Management’s Executive Development Center.”

Founded in 1979, the Executive Development Center (EDC) offers a wide range of continuing management education programs. Chervany’s background includes extensive executive development teaching as well as private and public consulting experience.

“Providing management education to practitioners who need to update their skills and knowledge to keep pace with a rapidly changing environment is one of our major missions for the 80’s,” said David M. Lilly, dean of the School. “Norm Chervany’s background and experience are ideally suited to the leadership of EDC at a time when executive education is being recognized as an important tool for effective management of all types of organizations.” □

Van de Ven—from page 1

According to David M. Lilly, dean of the School of Management, Professor Van de Ven brings to the 3M chair an outstanding background in organizational management. “To study organizations is to study the human network that is the very substance of the organization. His work in organizational context, design and performance places him among the best in the nation. We are very pleased that he has accepted this appointment,” said Lilly.

Lewis H. Lehr, chairman and chief executive officer of 3M, commented, “Professor Van de Ven’s expertise will bring to organizations in the Twin Cities and the state of Minnesota a greater understanding of the challenges facing all of us today in the management of human resources. We are proud to have such an outstanding candidate accept the 3M chair in human systems management.”

Van de Ven received his Ph.D. in Interdisciplinary Program Administration from the University of Wisconsin at Madison in 1972, and was on the faculty of Kent State University (1972-1975) and the Wharton School of the University of Pennsylvania (1975-1981) before his present position. He is also co-director (with Oliver Williamson) of the Center for the Study of Organizational Innovation at the University of Pennsylvania. □

RESEARCH UPDATE

Operations Management

The McKnight Foundation endowment fund is financing a cooperative research program on effective management of operations to help improve productivity in manufacturing operations. The project will address the central issue of effectively competing through operations and linking operations performance to business performance.

According to Roger G. Schroeder, professor of operations management, director of the Ph.D. program and director of this project, the research is directed toward improving business operations and requires cooperation between the University and the business community.

"We are committed to research that makes a difference," said Schroeder. "Therefore, research must focus on real problems of interest (both short and long run), and the results must be communicated to business practitioners as well as academicians."

Interdisciplinary in nature, the research is expected to take two years to complete. Researchers include Schroeder; John C. Anderson, associate professor of operations management and quantitative analysis; Arthur V. Hill, assistant professor of operations management and quantitative analysis; Ph.D. students Nicholas Moropolous and Jayant Saraph; and affiliated researchers Roger B. Upson, professor of finance and director, MBA program and Andrew Van de Ven, 3M Professor of Human Systems Management. □



Pictured in photo (left to right): Chen-En Ko, (University of Minnesota doctoral candidate); Professors Gordon L. Duke and Andrew D. Bailey, Jr. of the University of Minnesota; Merlin Dewing and Paul Phillips of Peat Marwick. Not pictured: Ray Myservy (University of Minnesota doctoral candidate).

Accounting

Professors Andrew D. Bailey, Jr. and Gordon L. Duke were awarded a research grant of \$35,000 by the Peat, Marwick, Mitchell and Company Foundation to study "Internal Control Evaluation by Computer—TICOM II." The long-range goal of the project is the development of a computerized internal control study and evaluation program that includes objective criteria and program linkages between

evaluation of internal control client information systems and audit application programs for clients and substantive testing.

Successful completion of TICOM II would provide a computerized tool to support accountants and auditors in the design and audit of accounting internal controls systems. TICOM II is closely related to the growing research on office information systems. For further information, please contact Andy Bailey at 376-2942. □

RESEARCH NOTES

Dennis A. Ahlburg: International study of link between fertility, labor market participation and declining population growth. (McKnight Foundation)

Gordon J. Alexander and P. George Benson: Valuation effects of announcements of voluntary corporate divestitures. (McKnight Foundation)

John C. Anderson, Arthur V. Hill, Roger G. Schroeder (Andrew Van de Ven, co-investigator): Planned organizational change and implementation risk analysis as a basis for materials requirements planning (MRP) installation. (McKnight Foundation)

John W. Dickhaut and Edward J. Joyce: Auditors' use of higher order mental processes, usefulness of verbal protocols, quality of resource allocation decisions. (McKnight Foundation)

Bruce R. Feiring: Utilizing traveling salesman subtours to create sales districts. (Dayton Hudson Foundation)

Kenneth Roering, Robert Ruckert, Orville Walker (Andrew Van de Ven, co-investigator): Relationship between organizational structure and marketing performance. (McKnight Foundation)

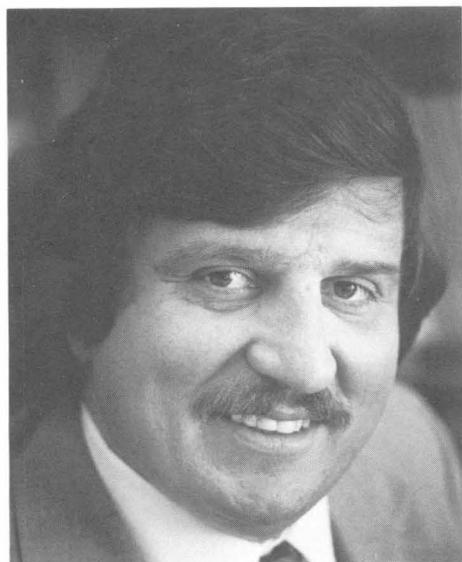
William F. Wright: Determinants of subjective uncertainty in decision situations. (McKnight Foundation) □

Join Your Company in Support of Higher Education

Over 800 companies will match gifts made by their employees to the School of Management, and some companies will match on a greater than one-to-one basis. In order to take advantage of a corporate matching gift program, simply contact your company's matching gift coordinator (usually in the personnel or community relations department), obtain a matching gift form, and send it with your gift to the School. If you forget to send the form with the gift, it may be submitted to the School at a later date.

The Why and How of Continuing Professional Education

by Norman L. Chervany, Director
Executive Development Center



Norman L. Chervany

On February 22, 1982 *Newsweek* magazine published a seven page article entitled "To Each His Own Computer." The article was full of a dazzling array of information and anecdotes about personal computers. For managers two of the more interesting quotes were:

"One of the best ways to understand the power of the current crop of personal computers and their lure for business and home alike is to compare them to mainframe computers of years past. The IBM Model 30 mainframe was introduced in the early 1960s and required special handling—an air conditioned room of about 18 feet square which housed the central processing unit (CPU), the control console and the desk for the key-punch operator. The CPU alone (the brain of the machine) was 5 feet high and 6 feet wide and had to be water cooled to prevent overheating. The CPU of IBM's new desktop Personal Computer is inscribed on a silicon chip smaller than a fingernail. The 360 Model 30 could do 33,000 additions a second at full speed. The Personal Computer will do 700,000 a second. In fact, in old 1960 dollars, the Model 30 cost \$280,000. The Personal Computer, fully equipped, runs between \$4,000 and \$5,000."

"... personal computers are used for mundane tasks, drawing on the computer's traditional capacity to crunch numbers. Business applications—accounting, budget forecasting, financial record keeping—are the most popular uses for the current generation of machines. One harbinger of the personal-computer revolution: in a Seattle drug raid last year, law-enforcement officers seized a key piece of evidence—an Apple computer loaded with the illicit operation's financial information."

The reason for considering continuing professional education does not rest on the advent of micro-technology and the personal computer. This area—quantitative methods for management and decision support systems—just happens to be my area of expertise. Every area of management is facing changes that are every bit as challenging as

those described in the *Newsweek* article. The innovations in financial strategies, the new rules in accounting, the new methods for marketing research, and the new concepts in human relations, all contain significant challenges—and opportunities—for management. It is a continuing struggle to keep current with these new ideas, let alone get ahead.

What should you do in the face of this knowledge/technology explosion? In a simple—but effective—fashion, you need to ask (and honestly answer) three basic questions for you and your staff.

1. Are there new ideas and skills that I (or my staff) need to acquire?
2. Can continuing professional education help to meet these needs?
3. What are the sources for productive continuing professional education?

I am obviously biased, but I believe that the answers to the first two questions are "yes." (Experts in the field of human resource development estimate that approximately 20% of the professional development needs of managers can be met through continuing professional education. The bulk of the development needs are met by on-the-job training and interaction with organizational peers.) Thus, the major hurdle facing you (and your organization) is to identify and evaluate alternative providers of continuing professional education.

The Executive Development Center in the School of Management is one such provider. It was started in 1979 in response to two forces. The first is the exponential explosion of new ideas for management; the second, the School's commitment to meeting the needs of its prime constituents—organizations and managers in the State of Minnesota, the Upper Midwest, and beyond.

The Executive Development Center has two basic types of programs for continuing professional education—general management programs and functional management programs. The general management programs are the Minnesota Executive Program (strategic planning for top management), the Minnesota Management Institute (translating corporate strategy into operating decisions for key operating managers), and the Minnesota Management Academy (studying general management issues for new managers). In all of these programs the focus is on covering the breadth of topics necessary for an individual assuming broader responsibilities.

The functional management programs are in-depth studies of strategic and operating level decisions in a single area of management. These include programs in the areas of manufacturing, marketing, information systems, finance, accounting, controllership and systems analysis.

The approach used in the programs of the Executive Development Center blends theory and practice, new research results and existing proven methods, lecture and experiential exercises. The key focus of each program is to provide participants with ideas and skills that they can put to work immediately in their organizations. But rather than just concentrating on what the manager should do, the programs also concentrate on why the suggested approaches work. In the long run, guidelines for managerial practice

Continued—page 7

FACULTY ON THE MOVE

John C. Anderson and **Roger G. Schroeder:**

Awarded Dean's Prize for the best applied research.
Subject—materials requirements planning.

Frederick J. Beier: Appointed to chairman of the Management Sciences Department.

Mario F. Bognanno: Appointed to chairman of the Industrial Relations Department.

Richard N. Cardozo with **Yoram Wind** and **Vijay Mahajan:** edited *New-Product Forecasting*, a book offering a systematic coverage of new-product forecasting models.

Blaine M. Cooke: Presentation to Augsburg Seminar in Applied Ethics on March 5, 1982.

Subject—"Business Responsibility: Government or Voluntary Controls."

Bruce R. Feiring: 1981 Summer Fellow at Johnson Space Center; presentations to Bell Telephone Laboratories, ORSA-TIMS Joint National Conference, Conferences on Computers and Industrial Engineering.

John J. Flagler: Appointed to permanent umpire for the State University System and the Interfaculty Organization; invited to present lecture series at Oxford University in 1983 on "The American System of Industrial Dispute Settlement;" presentations on arbitration and collective bargaining for Advanced Legal Education Institute, International Hospital Administrators Institute, George Meany Labor Center.

John H. Kareken: Appointed to chairman of the Finance and Insurance Department.

David M. Lilly: Elected to Minnesota Council on Foundations Board of Directors.

Patrick R. Pinto: Presentation on executive succession planning at Human Resource Planning Society Invitational Conference; seminar on career management strategies for the Food Marketing Institute; workshop on training and the law and individual development planning at Training '81 Conference.

Albert K. Wickesberg: Elected to Appleton Mills Board of Directors. □

CHART Cosponsors Scholarships for Women

CHART, a non-profit corporation dedicated to growth and career development for women, will cosponsor with the Executive Development Center two scholarships to the fall 1982 Minnesota Management Academy.

The scholarships will be made available to women who are participating in or have completed CHART's program and who otherwise would not have the resources necessary to participate in the program.

The Minnesota Management Academy is a ten-day residential management development program for the newer manager or professionals moving into management. □

Undergraduate Program Advisory Board Established

The revised undergraduate curriculum, implemented fall 1981, strives to respond to the needs of the management community which it serves. The Undergraduate Program Advisory Board, composed of leaders from the Twin Cities' business, government and not-for-profit organizations, was created in January 1982 to serve as a guide in this mission. The Board works directly with Dr. Julie Carson, director, Undergraduate Studies in an advisory capacity. Members of the Board are:

Marilyn Carlson-Nelson, Director of Community Affairs, Carlson Companies

James O. Cox, Vice President and Treasurer, Northern States Power

Merlin E. Dewing, Peat, Marwick, Mitchell & Co.

Joan Anderson Grove, Secretary of State

Ronald M. Hubbs, Retired Chairman and Former President, The St. Paul Companies, Inc.

B. Kristine Johnson, Corporate Relations, Medtronic

Marlene Johnson, President, Split Infinitive, Inc.

James P. Shannon, Vice President and Executive Director, General Mills Foundation

The Board meets four times a year to discuss issues of central importance to the evaluation and development of the undergraduate program. In March 1982 the Board members met with professors from the Rhetoric and Theatre Arts departments to discuss the development of oral communication courses tailored for management students. "Platform Performance," an exciting new course available beginning winter 1983 is a result of this first brainstorming session. The June Board meeting covered a number of issues, including the recent addition of a humanities course sequence to the artistic expression requirement, and establishing appropriate content, focus and stylistic techniques for courses in writing for management students.

The Board's dedicated commitment to quality management education is evident in their outstanding contributions to and enthusiastic guidance of the undergraduate curriculum. □

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Managers' MBA Off to a Fast Start

New in the School of Management is the Managers' MBA, an intensive two-year executive development program which combines continuous job performance with the MBA degree. The first class started in fall 1981; the second class of twenty participants started in fall 1982. The classes have managers from many areas, including finance, human services, manufacturing, and marketing. They have an average of eighteen years' experience, and one quarter are women.

This year's program started August 30, 1982, with a rigorous week in residence, and has since met every Friday from 8 a.m. to 5 p.m. A typical Friday has two sessions in the morning with one faculty member in a case study room in Blegen Hall, lunch at the Campus Club, followed by two sessions in the afternoon with another faculty member. Between one Friday and the next, participants meet in small groups to discuss upcoming cases, problems, and readings.

General management is the principal focus of the program. Management methods, concepts, and applications in the functional areas of business are emphasized in the first year. Problem formulation, decision-making and implementation in such areas as corporate strategy, finance, marketing, and operations will be covered in the second year.

The program faculty typically have above average teaching records in the day and evening MBA programs as well as in the School's executive development programs. Their teaching styles capitalize on the combined experience of the participants, especially through the use of the weekly small group meetings, in which participants integrate their experience into their class preparation. For example, Professor Mary Nichols created a strongly participative situation in her teaching of management and organizational behavior.

The program has short and long-run benefit to the participants. They cite examples of immediate relevancy occurring in areas of current work such as management by objectives, strategy, implementation of automated systems, and financial reports. Employers, in their nominations, indicate that many of the participants are potential candidates for greater, more wide-ranging responsibility in the future, and expect the program to provide a broader background for the opportunities that will come their way. □

Student presentation—Managers' MBA Program



Mary Lippitt Nichols

Professional Education—from page 5

without an understanding of the underlying cause-and-effect relationships become ineffective.

This is my first column for the *Minnesota Management Review*. Future columns will describe in more depth individual programs offered by the Executive Development Center. The column will also deal with key educational issues facing today's managers. If you have more questions—or suggestions for future columns—please feel free to contact me. □

Annual Giving Program Sets Record

Alumni and friends of the School of Management contributed \$136,215 in unrestricted annual gifts to the School of Management during the fiscal year ending June 30, 1982. "Unrestricted" means that the gifts can be used by the School in areas where needed most.

Alumni were asked to make gifts to either the School of Management Fund or the Accounting Fund. Gifts from individuals are used for a number of things within the School of Management, including: scholarships and fellowships; videotape equipment for the Placement Office and microcomputers and terminals for teaching and research; special library acquisitions; support for faculty research on actual business problems; publications; and program establishment.

"The General Mills Challenge Grant in 1979 really helped the School launch its Annual Fund program. In 1978, Annual Fund income was approximately \$12,000. In 1979, the year of the Challenge Grant, gifts from alumni and friends totaled \$87,000. And now, after our 1981-82 Annual Fund campaign, we are thrilled to announce that our alumni and friends have generously contributed over \$136,000 to the School," stated Gretchen Roufs, director of Alumni Relations. "Support from our alumni and friends provides the difference between an adequate program and one that is outstanding and highly responsive. We look forward to their continued involvement in our development efforts."

The Accounting Department contacts its alumni for support of that department specifically, as it has been doing for a number of years. Andrew Bailey, professor and chairman of the Department of Accounting, has been working on a special program with a number of public accounting firms. "The firms which are involved have generously offered to solicit support from their employees who are School of Management accounting program alumni. It has been a very successful partnership between the Accounting Department and the participating firms," stated Professor Bailey. "We look forward to continuing this relationship with the firms which are already involved and hope to add new participants each year."

The Annual Alumni Fund activities also serve another need for the School. Through direct contact with alumni, the School is able to obtain its information about alumni. A data base with accurate and solid information about the alumni of the School of Management is helpful in a variety of areas:

Continued—page 10

Increasing Productivity—from page 1

techniques called Heuristic Development and Prototyping.

Systems Development Methodology Lags Behind Technology

First, it is important to realize that information systems development methodology lags behind information systems technology by 5 to 10 years. We just figure out how to develop systems for one era of technology when in comes a new era. For example, many online systems were developed using batch technology methodology. The result?—Fixed reports and terminal displays; no flexibility in online inquiry, just faster response. As a second example, many database management systems were implemented using single application development methodology. The result? No integration of systems; the database management system is only used as an improved file access technique.

Failure to capitalize on technological advances by updating methodology is not unique to information systems. Consider the revolutionary war. The British troops' methodology of attack was to wear red jackets and march shoulder to shoulder several soldiers deep. This methodology was effective for sword and shield technology; it was obsolete and disastrous for rifle technology. Nevertheless, they continued with the methodology as the revolutionaries exploited rifle technology by firing from behind trees and rocks.

In retrospect, it is hard to imagine why the British were so slow to change their methodology. But consider what we have been doing with information systems development methodology. Few systems analysts claim to have developed systems using traditional systems development methodology that are either as fast as the user wants or are accepted "as is" in their first version.

Information Requirements Determination

It is simply a difficult task for a manager to define his or her information requirements in the abstractions—flow charts, file layouts, logic specifications and report formats—used by systems analysis. This process is analogous to asking a home buyer to make all decisions about the details for a house from an architect's blue prints. Architects indicate that people having homes built, like users having systems built, are continually making design changes during "implementation." And few custom built homes, like information systems, provide what is really needed the first time. Indeed, people often have to build two or three homes over a period of time before the "ideal" house is built.

The fact that users ask for changes once a system is in place suggests that defining user requirements needs to be a *heuristic*, or *learning* process that allows for an iterative or evolutionary development process. Managers should be given the opportunity to work with the output of a system before massive development effort goes into the final system.

In the home building analogy, consider the advantage of an approach to home building that would provide for developing a model home, allowing families to move in their furniture and temporarily live in the house. Based on what they like or disliked, a new version of the home is generated and the process repeated until the family is satisfied. Based upon architects' experience, an average of three versions

should allow a precise definition of requirements. Unfortunately, housing construction technology is not yet flexible enough to make this approach to home building feasible.

Heuristic Development and Prototyping

However, information system technology is now flexible enough to make such an approach to information system building feasible using advanced development techniques called Heuristic Development¹ and Prototyping.² On-line technology makes user interaction with the system more practical than it is with batch-produced reports. Also, the state-of-the-art in easy-to-use information-retrieval (query) languages has improved dramatically and is continuing to improve. Database management systems allow significant improvement in data manipulation. More directly in support of management decision making, there is a proliferation of application-oriented models and easy-to-use modeling languages for decision support systems.

The premise behind both heuristic development and prototyping is that most people like to solve problems using a cognitive style that is intuitive/heuristic. That is, they like to come up with a rough solution, and by trial and error, shape the rough solution into a refined solution.

Consider, for example, the way most of us solve puzzles such as the Rubik cube (in the case of Rubik's cube, "attempt to solve" is often the case). Most people get a general idea of what they are trying to do. Within a few seconds of looking at the cube they generally start manipulating it to learn how it works. Through trial and error, different strategies are attempted. Strategies that don't work are rejected; ones that appear to work are explored further until a solution is reached. Based upon a series of studies conducted by the MIS Research Center, this is the approach to problem solving most people use and are the most comfortable with.³

By using advanced technology, prototypes of information systems that reveal what a completed system will be like can be easily and quickly created. Managers can then test the prototype and determine what they like and do not like about the system. The prototype can then be changed in response to management's suggestions.

One of the interesting things that these advanced approaches to system development have revealed is that users also need to go through an average of three versions of a system in order to accurately define their needs. This is both interesting and helpful. Over the years, system analysts have concluded that users could never stabilize their requirements. Consequently, analysts often require a "design freeze" to control users' vacillation. This "signoff" procedure was designed to contractually obligate the user to stop making change requests and to be satisfied with the system. It rarely works, since it addresses the symptom, not the problem. Users need the opportunity to discover their information needs by interacting with the system. Until they do interact with the system, their requirements cannot stabilize. But users can be satisfied if given the chance to test enough versions of the system.

Application of Heuristic Development and Prototyping

Advanced development techniques have been

successfully used in a wide variety of applications in diverse organizational settings with the following positive benefits:

- shorter development time
- more accurate determination of user requirements
- greater user participation and support
- less threatening process to users

Companies who are working with the heuristic or prototype approaches associated with the MIS Research Center include: National Car, Donaldson Company Inc., General Mills, and Super Valu.

Dave Johnson, vice president of information systems at National Car says: "We have found the heuristic and prototyping approaches to be very successful, having developed several systems that way. The largest project we undertook using prototyping was to develop our national online network. Once that system went in we had only a few minor changes. A big breakthrough."

Jim Throckmorton, director of data processing for The Donaldson Company, Inc., looks at it this way: "In order to reduce the backlog of systems waiting to be implemented, we *must* shorten the system development time. Heuristic development has been one of the most successful methods we have used. We plan to expand its usage to many more systems. Another advantage to it is that there are significant dollar benefits to the company because the systems begin to provide deliverables far earlier than in standard system development approaches."

Sue Eastes was formerly director of systems development and currently is director of control and administration at General Mills. She states, "We are new at this process, but we have used it successfully in several applications. Now we are finding we cannot get the concept implemented fast enough. It has been a real eye opener for us. We have never had such user acceptance or made such rapid progress with systems. But we are still learning. We are not yet sure we can do this with all systems but we are definitely going to continue working with it."

At Super Valu, Rod Davis, director of methods, reports: "We have got to develop systems quicker and to more accurately get at user requirements. We think the heuristic and prototyping approaches are the answer."

System development has become a more methodologically intense and cumbersome process over recent years with more and more checklists and signoff procedures. Such processes tend to cause "paralysis by analysis." Accordingly, the simplicity of the advanced techniques of system development is perhaps its greatest virtue. As James Martin states:

Throughout the history of engineering a principle seems to emerge: Great engineering is simple engineering. Ideas which become too cumbersome, inflexible, and problematic tend to be replaced with newer, conceptually cleaner ideas which when compared to the old, are aesthetic in their simplicity. . . .⁴

FOOTNOTES

1. Berrisford, Thomas and Wetherbe, James C., "Heuristic Development: A Redesign of Systems Design," *MIS Quarterly*, Vol. 3, No. 1, March 1979, pp. 11-19.
2. Naumann, J. David and Jenkins, A. Milton, "Prototyping: The New Paradigm for Systems

Development," forthcoming in the *MIS Quarterly*, Vol. 6, No. 3, September 1982.

3. Chervany, Norm; Dickson, Gary W.; and Senn, Jim; "Research in MIS: The Minnesota Experiments," *Management Science*, Vol. 23, No. 9, May 1979, pp. 913-923.
4. Martin, James, *Principles of Data-Base Management*, Prentice-Hall, Englewood Cliffs, New Jersey, 1976.

James C. Wetherbe is associate professor of management information systems and director, Management Information Systems Research Center at the School of Management. □

ALUMNI ADVISORY COUNCIL HIGHLIGHTS



Steve McArthur

The Alumni Advisory Council of the School of Management is the group which represents the partnership between the School and its alumni. It was established as a result of a long range planning process centered around a mission statement developed and adopted by alumni leaders.

The statement, "Our Mission: to help make the School one of the best in the country," and the commitment to an action-oriented relationship with the School are the two things which best describe the Alumni Advisory Council.

Steven W. McArthur, '67, assistant controller, Dayton Hudson Corporation is the chairman of the Council. Other members of the Alumni Advisory Council include: **Bette Abraham**, '81 MBA, financial analyst, Pillsbury Company; **James O. Cox**, '50, vice president and treasurer, Northern States Power; **Merle D. (Buck) Menssen**, '59, MBA '73, area-controller-Europe, 3M; and **James W. Rustad**, MBA '72, account executive, Merrill Lynch, Pierce, Fenner, and Smith.

This fall, in addition to their overall activities as advisors, evaluators and resource people, Alumni Advisory Council members will be involved in a number of projects at the School. In the spring of 1982, the student organizations at the School were asked to define ways in which alumni could be of assistance to them. As a result, the Alumni Advisory Council will be working with such organizations as the Business Board, the MBA Association, the *10-K Review* (the quarterly student publication), the Minnesota Student Accounting Association, and AIESEC-Minnesota (the International Association of Students in Economics and Management). Alumni will be helping these organizations to set up contacts with companies, identify speakers for programs, and arrange for alumni participation in on-campus programs.

Other areas of Alumni Advisory Council activity this fall will include Council members' input and evaluation on current and future alumni publications (specifically, the *Minnesota Management Review*) as well as significant involvement in the areas of placement and career planning. This includes a new program, the **ALUMNI CAREER ADVISORS NETWORK**, which has recently been established at the School of Management.

Continued—page 10

Annual Giving—from page 7

placement, development, alumni and corporate relations, and planning.

For additional information about the School of Management Fund or the Accounting Fund, contact Gretchen Roufs at (612) 376-3217 or Andrew Bailey at (612) 376-2942.

ALUMNI PROFILES

Two alumni of the School of Management sport some interesting characteristics. One such characteristic is that these two people are members of the first graduating class of the School of Management (then, the School of Business), the **class of 1921**. Another is that they were the first couple to be married from within a graduating class. The last characteristic is native to the woman involved. She was one of two women in the class of 1921.

Gerhard and Selma Neils are the people involved here, and they met in a money and banking class in their junior year of college. They relate the story that the dean of the Business School in 1921 asked them to send a wedding picture so that it could be placed in the hallway of the School in order to encourage more women to enroll in the Business School! (Today, about 50% of the School of Management's students are women.)

Gerhard and Selma Neils are both natives of Minnesota who moved to the Pacific Coast in 1924. Gerhard is the son of the founder of the old J. Neils Lumber Company of Cass Lake, Minnesota, and it was the lumber business that brought them to Klickitat, Washington in 1924. They lived there until Gerhard's retirement in 1963 and then moved to their present home in Tigard, Oregon.

Selma is a writer who has authored a book entitled *So This is Klickitat*, the story of the people and development of the small Washington logging town near the base of Mount Adams, and is presently working on another book about the Klickitat Indians.

The Neils have three children, enjoy activity in large quantity, and travel extensively. They visited Minneapolis in June, 1982. □



The graduates of the MBA program at the School of Management go into a variety of fields and positions, and one of the 1981 MBA graduates is breaking new ground.

Helen Lacko, MBA '81, is Denver, Colorado's first full-time television business reporter. She is with KBTB, which reaches six states, and in the Denver metro area alone, the station reaches 215,000 homes.

Lacko does nightly reports on major business developments, real estate and finance, corporate and consumer features, and money issues.

"The strongest feeling in the Denver area is that of growth. Building and construction are going on all over, and the impact of high technology and the oil and gas industries on the city is phenomenal," Lacko stated. "It's exciting to be able to deliver the stories on the area's corporate and industrial progress. Denver television's awareness of the need to bring this kind

of news to the people is definitely increasing."

When asked how her MBA helps her as a news reporter, Lacko responded with, "I use it in that I can communicate with executives at all levels." She related that one of the first people she talked with in Denver was an executive with a privately held company. It wasn't until he found out that she had an MBA that he granted an interview, and he also took the TV crew through the plant. It was the first time a television crew had been allowed into the facility.

Lacko knows the newsroom from all angles. She's been a news producer for several stations, including WCCO television news in the Twin Cities while she was an MBA student. During her work at the University of Minnesota School of Management, Lacko's Plan B project was a research study and paper entitled "The Electronic Newsroom: A Functional and Financial Analysis." *Broadcast Communications* September 1981 magazine published an article about her paper and called her study one of the most exciting new developments in the field of computerized newsrooms. The article said, "The Lacko study is a breakthrough in the hardheaded analysis of the cost-effectiveness of newsroom computer systems."

Besides having her picture on 80 billboards advertising the station, Lacko has also been featured in the local press. One of the local columnists wrote, "Helen Lacko's reports indicate she knows her field. And she also displays the ability to translate complicated business dialogue into a language the average viewer can understand." Helen Lacko has quickly become a well-known person in Denver.

A Colorado native, Lacko received her bachelor's degree in sociology from the University of Utah in 1976. □

Advisory Council Highlights—from page 9

Alumni Advisory Council members will assist the School in identifying and contacting alumni in order to encourage their participation in the Alumni Career Advisors Network. Alumni who are part of the Career Advisors Network serve as resource people in a variety of ways, including: working with students on a one-to-one basis providing advice on specific career areas (e.g. marketing, finance, etc.) and/or specific companies; speaking to groups upon request; participating in programs as panelists; helping students obtain jobs and internships, and other *ad hoc* activities.

Alumni Advisory Council members will also be helping the School to inform corporations and individuals of the services available through the Placement Office. One such service is the listing of immediate job openings in the Placement Office for employers who wish to fill positions by hiring School of Management students and alumni.

For more information or questions about the Alumni Advisory Council, please contact the Alumni Advisory Council through the Alumni Relations Office of the School of Management, 271 19th Ave. S., Minneapolis, MN 55455, or Gretchen Roufs, Director of Alumni Relations, at that address. □

ALUMNI UPDATE

Howard M. Guthmann, '43, St. Paul, MN, has been awarded the first Public Service Award presented by the Minnesota Society of Certified Public Accountants. He received the award in recognition of his outstanding community service record. Guthmann is president of the accounting firm of Wilkerson, Guthmann and Johnson, Ltd. in St. Paul. He was recently appointed by Governor Quie to the Minnesota State Board of Accountancy.

Donald E. Toland, '49, Bourbonnais, IL, is associate professor, speech communication and director of broadcasting services at Olivet Nazarene College. He received his master of arts degree in mass communication at the University of Denver in 1968. He and his wife Beverly have one son and two daughters.

Frederic Owen Anderson, '56, Citrus Heights, CA is vice president, Government Health Services Division, Computer Service Corporation, in Sacramento, CA.

Jacob G. Birnberg, '56, '58, and '62, Pittsburgh, PA, received Alpha Kappa Psi's award for the best article in accounting in 1980. He is professor of business and director of Ph.D. programs at the University of Pittsburgh.

David H. Jensen, '58, Charlotte, NC, is currently vice president-human resources for Minnesota Fabrics in Charlotte, NC.

Stanley J. Hill, '59, '62, and '66, Columbia, MO, is the dean of the College of Business and Public Administration, University of Missouri. He and wife Gail Anne have four children.

Richard E. Wethe, '70, Woodbury, MN, is the information systems manager, Decorative Products Division, 3M, St. Paul.

Howard J. Chanan, '70, Minnetonka, MN, is the vice president, Northern Auto Parts Company, Inc.

Paul B. Veit, '72 MBA, Columbus, OH, is with Columbus Steel Supply Company and is the treasurer and vice president for finance.

Carol E. O'Toole, '73 MAIR, Minneapolis, MN, recently opened her own law firm in Minneapolis.

Raphael Benaroya, '73 MBA, has been named executive vice president of Jordache Enterprises, Inc., New York. Benaroya had been vice president of management information systems at David Crystal, a division of General Mills, Inc.

Charles H. Meyer, '74, Roseville, MN, was appointed to the American Bar Association committee on corporate law and accounting. He is an attorney with the Oppenheimer law firm in Minneapolis.

Robert S. Gillman, '74, '75 MAIR, is with Andcor Companies, Inc. in Minneapolis as a personnel consultant. He was previously employed in personnel management at Gould, Inc. and at Sperry-Univac. He and his wife have one daughter.

William M. (Mike) Newell, '75, Spring Valley, CA, a lieutenant in the U.S. Navy Supply Corps is stationed in San Diego, CA and is assistant supply officer and comptroller. He and his wife Debbie have one daughter. Mike is working toward a masters degree in management from the University of Southern California.

Craig Olson, '74, Buffalo, NY, is an assistant professor of industrial relations at SUNY-Buffalo School of Management.

Ross Arneson, '76, St. James, MN, graduated from William Mitchell Law School and is assistant county attorney in Watonwan County.

John Dellmar Robinson, Jr., '76, Naperville, IL, is with the Hallmark Marketing Corporation and is area chain executive and district sales training coordinator-Chicago. He started the MBA program at George Williams College.

David Curtis Williams, '77, Fairfax, VA, is with the U.S. Navy—Naval Communications Unit, Washington, D.C., as a civilian computer specialist in telecommunications.

William J. Dunn, Jr., '78, Skokie, IL, is a commodity floor trader at the Chicago Board of Trade.

Jerry Jermann, '78 MBA, Lisle, IL, formerly vice president of data processing for Information Resources, Inc., a Chicago-based market research firm, has been named senior vice president of new market development for the same firm.

David S. Henderson, '79, Coon Rapids, MN, is purchasing manager for the Federal Cartridge Corporation in Anoka.

Dwight L. Johnson, '81, Ypsilanti, MI, is a financial analyst in the controller's department, Car Product Division, Ford Motor Co., Dearborn, MI. □

ALUMNI UPDATE

Information furnished by alumni on this form will be used for the alumni news section of the *Minnesota Management Review* and will help the School maintain accurate home and business address records.

Date _____

Name _____
(Last) (First) (Middle or Maiden Name)

Year of Graduation from School of Management _____ Degree(s) granted from School of Management _____

Home Address _____
(Street) (City) (State) (Zip)

Current Employer _____
(Position) (Mailing Address)

(City) (State) (Zip)

Home Phone: _____ Business Phone: _____

INFORMATION YOU WOULD LIKE TO SHARE WITH THE SCHOOL OF MANAGEMENT AND ITS ALUMNI (CAREER, FAMILY, AWARDS, ETC.):

SEND TO: Gretchen Roufs, Director, Alumni Relations, School of Management
 University of Minnesota, 271 19th Ave. S., Minneapolis, MN 55455
 Phone: (612) 376-3217

EXECUTIVE DEVELOPMENT CENTER 1982-83 PROGRAMS

I. General Management Residential Programs

Minnesota Executive Program (6 weeks)

September 1-February 18, 1983

Minnesota Management Institute (4 weeks)

Fall 1982 (September 30-December 10, 1982)

Spring 1983 (February 17-May 13, 1983)

Minnesota Management Academy

Fall 1982 (October 23-31, 1982)

Spring 1983 (April 23-May 1, 1983)

II. Management Seminar Programs

Seminars for the Systems Analyst

October 3-8, 1982

April 24-29, 1983

June 19-24, 1983

Manufacturing Management

May 1-7, 1983

Managing the Small Firm for Profit and Growth

January 13-15, 1983

March 3-5, 1983

Finance for the Non-Financial Manager

December 8-10, 1982

March 9-11, 1983

June 1-3, 1983

Effective Management of Information Systems

November 17-19, 1982

March 2-4, 1983

May 11-13, 1983

Marketing for the Non-Marketing Manager

December 1-3, 1982

March 8-10, 1983

June 8-10, 1983

Sales Force Management

October 31-November 5, 1982

May 15-20, 1983

Financial Accounting Standards Board Update (FASB)

November 4, 1982

Accounting for the Non-Accounting Executive

October 7-8, 1982

January 13-14, 1983

May 23-24, 1983

Controllership Academy

October 17-23, 1982

April 17-23, 1983

Internal Controls

December 13-15, 1982

The Effective Internal Audit Department

February 10, 1983

For brochures or registration/application, call the Executive Development Center at 612/373-3837, or write to:

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