MnIPS NEWSLETTER

A Publication of the Minnesota Information Professional Society - Vol. 1, No. 6, March, 2000

NEWSLETTER INFORMATION

The MnIPS Newsletter is published nine times a year (September-June) by Minnesota Information Professional Society. We welcome materials submitted to our calendar or articles on computing topics. Submit materials by disc or e-mail to:

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NOTE:

MEETING INFORMATION

The meeting place:

Holiday Inn - Bloomington
35W and 94th
(1201 W 94th St.)
Phone: 884-8211

Meeting Times:

5:00 P.M. Social & Registration
5:45 P.M. Dinner
6:45 P.M. Meeting and Program
8:00 P.M. Adjourn

For reservations call:
Dennis Cummings by Mar. 17th

And Choose
Filet Mignon or Salmon

Tel. (651) 707-0523 (H) or
(651) 205-2632 (W)
or
E-mail:
Dennis.Cummings1@usbank.com

$20 for members
$25 for non-members

Dinner Meeting NOTICE Tuesday March 21, 2000

Meeting of
Minnesota Information Professional Society (Formerly ACM\ & ASM)

Speakers Topic**: "Planning Technology for a Competitive Advantage"**
Speaker: **Anita Cassidy**

SPEAKER Profile

Anita Cassidy has over 24 years of experience in Information Systems, with positions such as CIO/Vice President, Director, and Manager at worldwide Fortune 100 manufacturing companies. She is currently President/CEO of Strategic Computing Directions, Inc., which is an executive information systems consulting company specializing in strategic planning, software selections, IS assessments, process re-engineer-ing, and provides interim IS leadership. Anita has a Bachelor of Science degree from University of MN and has also attended St. Cloud State University. She has authored a book titled "A Practical Guide to Information Systems Strategic Planning" published by St. Lucie Press (1998). She is also finishing her second book titled "A Practical Guide to IS Process Improvement" which will be published in 2000. Anita has been profiled in an article by Inc. magazine and has spoken at several local and national conferences and associations.

TOPIC INFORMATION

Utilizing new technology is the single most important critical success factor for your company's future. Rather than an afterthought, technology is becoming an integral part of businesses today. Learn how your company can utilize emerging technologies (such as the Internet, E-Business, Supply Chain Management, Customer Relationship Management) to provide your organization with a competitive advantage in the marketplace. If you don't plan your IT direction and ensure that it is properly aligned with the business objectives, you may find yourself spending thousands or even millions of dollars solving the wrong problems and impacting your organizations competitive position. This session will provide an overview of a structured approach to developing a technology plan that will align the technology direction with the business direction and provide true value to the business. Specific components of both a business plan and an IT strategic plan will be identified. Begin your IT strategic planning efforts today!

President's Letter

Greetings:

We are on a roll!! We had another great turnout for our February meeting, and are looking for continued high participation for our March meeting. Thanks

to everyone who attended and made it the success we are striving for.

Be sure to attend the March meeting on Tuesday March 21 to hear Anita Cassidy talk about **Planning Technology for a Competitive Advantage**. Your continued support will make this the best year in a very long time.

We continue to push towards a newly revitalized organization by making improvements to our overall strategy. Prior to the last monthly meeting on February 15, the Strategic Planning Committee met and executed a Strategic Action Workshop. The workshop was a vehicle to allow us to discuss our strategic plans, and then formulate an action plan.

Out of this workshop came three leadership teams designed to focus on specific areas: 1) Marketing/Outreach/Community Service, 2) Active, Interested, Growing Membership, and 3) Our Potential to IT Professionalism. Each of these teams will execute plans to strengthen MnIPS core benefits to both our current and potential membership.

As we push forward we will be looking for additional leaders to help guide the way to a better future for all of us.

Speaking of leadership, we need members who want to run for office next year or help with the Strictly Business Expo seminars, which will be sponsored by MnIPS on June 8th and 9th this year. Please contact any of the board members or members of the education committee to find out how you can help. We look forward to seeing you on the 21st!

Sincerely,
Joe Perzel **,**
President

YEAR 2000 MnIPS MEETINGS

by Carol Pederson

Below is the program for 1999-2000 dinner meetings. The schedule is complete with confirmed speakers. We still have the opportunity to pursue other organizations for joint meetings. So, if anyone has suggestions, please let me know.

Date, Title & Speaker

- Mar 21 Planning Technology for Small Companies, Anita Cassidy
- Apr 18 Communication and Technology, Paul Kiley
- May 16 joint meeting with AIT, Realizing the Benefits of Information Technology, John Thorp.

YEAR 2000 AITP MEETINGS

- **March 2, 2000 Monthly Meeting. Speaker:** Michael Norton **Topic:** Recent Developments in Secure Electronic Transactions
- **April 6, 2000 Monthly Meeting. Speaker:** Rachel Hollstadt (moderator), **Topic:** IT Managers Panel on "How to Have a Successful Project"

May 16, 2000 Joint Meeting with MnIPS. Speaker: John Thorp, **Topic:** Realizing the Benefits of Information Technology.

IT Managers Can Develop & Maintain WORK-able Programs

January 18, 2000
MnIPS meeting review
(Reported by Dennis Cummings)

Dr. Kurt Linberg was the featured speaker at the January 18th MnIPS dinner meeting held at the Bloomington Holiday Inn. His topic was "Job Satisfaction of Software Developers (hereafter called SD's): Key Insights for Recruiting and Retaining Software Professionals in the New Millennium". Dr. Linberg presented a summary of his dissertation research results where he studied job satisfaction of senior-level SD's. These results provided new insights into how organizations can better recruit and retain SD's in the new millennium.

Dr. Linberg has 20 years experience in software development and software project management involving mission-critical and life-critical software applications. He currently is a systems engineer at Medtronic, the principal at Better ODDS Consulting and the Program Director of Information Technology at Capella University. He holds a Ph.D. in Applied Management and Decision Sciences from Walden University where he focused his studies on understanding how to better manage creative endeavors like software development. He has an MS in Software Engineering from the University of St. Thomas in St. Paul, Minnesota. He also graduated Summa Cum Laude with a BS in Applied Mathematics from the University of Wisconsin. Dr. Linberg, a scholar-practitioner, has published six papers dealing with topics including software quality assurance, software project management, and software organizational leadership and development.

Dr. Linberg started the meeting by introducing himself, giv-

ing a hardcopy outline of his "Job Satisfaction Among SD's" presentation and stating his passion for "programmer happiness" statistics (pronounced "sadistics" in my college courses). His mentor at Walden University, Earl Joseph (a.k.a. the MnIPS newsletter editor and IT futurist) once quoted recently that "The problems associated with the management (or mismanagement) of software development haven't changed much in 40 years". In other words, corporate leaders must understand the IT impact on business while effective managing creative software professionals. Managers must integrate the technological perspective with business and humanistic factors.

What is the impact of software development on a business' bottom line? Dr. Linberg suggests a quote from his research: "Software is and will be at the core of most innovation during the next several decades. The World Wide Web has already stirred up imaginative possibilities for a plethora of new markets, products, services, arts, and information potentials--all software-based. These will grow exponentially as more and more minds interconnect to utilize them. But startling as these prospects are, they provide only glimpses of the many opportunities that software innovation presents." There is no doubt that IT is largely involved, but should management be pushing the "panic button" just yet? While that's certainly an option, we can behave like a good football coach: scout the opponent, develop a game plan and execute it on the field.

The IT manager's opponents may be: growth limits, business reengineering, attracting/retaining SD's and attracting/retaining/mo-tivating individual team members. The IT growth limits seem to be that the company "needs" more software despite its tighter profit margins and increased global competition. Add to that mix, the need to keep up with industry hardware and software standards such as automated and flexible manufacturing and integrated systems (collaboration, knowledge management, e-commerce, EPR, etc.). Attracting SD's is tough enough on the "supply side" itself, the IT market were short 190,000 of them in 1997 alone and Bill Gates in 1999 projected that 500,000 more will be needed in the next several years. Retention is even more of a concern as SD turnover is 20% or higher per year in certain areas and that it increases costs and schedule problems by 60%. Once SD's are attracted and/or retained, motivation is key. IT managers must integrate a technological focus with a behavioral science focus, not overemphasize controls over projects and people.

Dr. Linberg pointed to a few motivational models which IT managers can study. A. H. Maslow's "Hierarchy of Needs" model shows that individuals are motivated within a natural progression of higher need satisfaction toward self-actualization. McClelland's "Trichotomy of Needs" model states that individuals are motivated by affiliation, power, and achievement needs. Finally. Herzberg's "Two Factor Theory of Motivation" finds that conditions, which create the greatest dissatisfaction within a work situation, contribute relatively little to motivation when they are improved. This includes both intrinsic and extrinsic motivation.Two of the main SD motivators are "participative decision making" and "participative management" models. Participative decision making is defined as the extent that workers perceive they have opportunity to influence decisions involving the actions that they will eventually execute, rather than perceiving that the decision processes are isolated in the higher levels of the organization, with actions carried out by lower levels. Participative management is a general term describing a managerial style or organizational model which is characterized by highly involved employees, a climate of trust, open communication, and consensus or participatory decision making. Dr. Linberg helped us understand these models by stating that managers are motivated by power, have a focus on control and have a individualistic (though not always market-based) attitude on quality, schedule, effort and cost. Conversely, SD's are motivated by achievement (e.g. patents), have a focus on achievement and sometimes have a conflicting attitude with management regarding quality, schedule, effort and cost.

What project activities "turn-off" SD's? In the Project Planning stage, technologically unrealistic requirements at the system level and methodological incompatibility do so. In the Requirements Definition stage, technologically unrealistic requirements at the software level contribute. In the Software Design stage, low confidence in the architectural design meeting the business' needs will be a key factor. In the Coding stage, low confi-

dence that the code still represents the design stands out as a problem. In the Integration and Testing stage, low confidence that the software is of sufficient quality is a major concern. In the Distribution stage, low confidence that the software is of sufficient quality and any decision to cut features in order to meet schedule or to cancel a given project. In all of the aforementioned stages, one should also consider unrealistic schedule and effort estimates and the lack of software personnel or other necessary resources available to do the work.

How did Dr. Linberg find these interesting conclusions? He conducted research that included an explanatory study with a correlation design, covers a target population (i.e. competent, experienced, achievement-oriented, and continual learners) and survey instruments such as the Minnesota Satisfaction Questionnaire (short form) and SD Participative Decision Making Scale (SD-PDM). The Minnesota Satisfaction Questionnaire (MSQ) is available from the University of Minnesota and measures Intrinsic, Extrinsic, and General Satisfaction. It asks 20 questions such as "How do you feel about the working conditions?" and "How do you feel about the amount of praise you get for doing a good job?" The SD-PDM scale. A researcher developed it in consultation with an industry/academia panel of experts. It has 12 questions and addresses assessed reliability and content validity prior to use. It identifies individual job happiness and decision-making attributes as well as their correlation with general job satisfaction.

The SD-PDM Scale specifically asks SD's to rate:

1. I participate in estimating the effort to develop a software feature/ application.
2. If I determine that the estimated time to complete a software feature/application is not realistic, I can work with my supervisor or team leader to either adjust the scope or extend the schedule accordingly.
3. I participate in the selection of development methodologies.
4. I participate in the selection of development tools.
5. I interact with the customer/end-user to better understand software requirements.
6. I can decide how my feature/application is designed.
7. I can decide how my feature/application is coded.
8. I can decide how my feature/application is tested.
9. If I identify an issue that could add risk to completing the software project, I'm asked to participate in resolving the issue.
10. I am involved in defining how I will be rewarded or recognized for my work.
11. As I experience "lessons learned", I am given the opportunity to inform others within the organization.
12. I participate deciding if software that I develop is ready to ship to customers.

The highest Job Satisfaction correlation (per MSQ attributes) seem to be:

1. Feeling of accomplishment I get from the job.
2. Chance to do something that makes use of my abilities.
3. Chance to try my own methods of doing the job.
4. Freedom to use my own judgment.
5. Chance to do different things from time to time.
6. Chances for advancement on this job.
7. Praise for doing a good job.

Conversely, the lowest (MSQ) Job Satisfaction correlation are:

1. The working conditions.
2. The way my co-workers get along with each other.
3. The chance to work alone on the job.
4. My pay and the amount of work that I do.
5. The way my job provides for steady employment.

The highest Individual SD-PDM Correlation appear to be:

1. As I experience "lessons learned", I am given the opportunity to inform others within the organization.
2. If I determine that the estimated time to complete a software feature/application is not realistic, I can work with my supervisor or team leader to either adjust the scope or extend the schedule accordingly.
3. I am involved in defining how I will be rewarded or recognized for my work.
4. I participate deciding if the software that I develop is ready to ship to customers.

Some SD comments on motivation that Dr. Linberg found are:

Challenges, respect and confidence I receive in performing my job.
Challenge, love the business, company is great, my work is respected, team members are fun.

3. Opportunity for creativity, pleasant working conditions.
4. Money!
5. One day closer to being fully vested and at that time I will seek new opportunities.
6. Get there early so I can leave early! My talents are not being put to good use.
Money! I don't like my job, but they pay tuition.

Dr. Linberg's key findings on SD job satisfaction were:

1. SD's involved in decision-making have higher job satisfaction than those who are not involved in decision making.
2. Establishing a sense of accomplishment contributes most to job satisfaction of SD's.
3. When job advancement opportunities are clear, SD's have greater job satisfaction.
4. Supervisors who frequently praise their SD's for doing good work contribute to SD's job satisfaction.
5. SD's who are given an opportunity to share their lessons-learned have higher job satisfaction than those that do not.

What did Dr. Linberg finally conclude regarding his findings? Leaders within an organization developing software MUST seek to understand key aspects of SD's job satisfaction. Leaders must also work at enlightening both managers and SD's to the "Motivational Conflict" and resolve the incongruency it causes. Unless these organizations establish an environment that facilitates SD's delight (high job satisfaction), these organizations will not be able to attract and retain SD's in the new millennium.

Dr. Linberg feels that A. H. Maslow in 1971 had the best handle on situations such as the SD's job satisfaction in the following quote. "I think the problem of the management of creative personnel is both fantastically difficult and important. I don't quite know what we are going to do with this problem because, in essence, what I am talking about is the lone wolf. The kind of creative people that I've worked with are people who are apt to get ground up in an organization, apt to be afraid of it and apt generally to work off in a corner or in an attic by themselves. This is also a little like trying to reconcile the revolutionary with the stable society because the people that I've studied are essentially revolutionary in the sense of turning their backs on what already exists, and in the sense of being dissatisfied with what is now the case."

What's the "bottom line" of Dr. Linberg's talk? Managers are motivated by power and SD's by achievement. Managers should be a "facilitator of congruency and trust" while SD's should use "creative integration of technology and the business goals." The successful outcomes that result from this cooperation will be improved project quality for managers in terms of schedule, cost and team effort. SD's will experience an improved integration of their achievement needs and the business' realistic goals. Together, both groups move towards an overall organizational learning experience benefiting everyone in future project undertakings. If you wish further information, feel free to contact Dr. Linberg at (612) 252-4335 or e-mail him at klinberg@capella.edu.

COMPUTER TIME-LINE

by (slightly revised and adapted from) Peter W. Nyhlen

- Stone Age: n., adj. In computer folklore, an ill-defined period from ENIAC (ca. 1943) to the early-1950s; the great age of electromechanical {dinosaur}s, tubes, and mercury delay lines, and/or relays.
- Bronze Age: n., adj. In computer folklore, a period from the early-1950s up to 1960--61 (see {Iron Age}). The era of transistor-logic, pre-ferrite-{core} machines with drum or CRT mass storage.
- Iron Age: n. In the history of computing, 1961--1971 --- the formative era of commercial {mainframe} technology, when ferrite-core {dinosaur}s ruled the earth. The Iron Age got rolling, ironically enough, with the delivery of the first minicomputer (the PDP-1) and ended with the introduction of the first commercial microprocessor (the Intel 4004) in 1971. See also {Stone Age}; compare {elder days}.
- Elder days: n. The heroic age of hackerdom (roughly, pre-1980); the era of the {PDP-10}, {TECO}, {{ITS}}, and the ARPANET. This term has been rather consciously adopted from J. R. R. Tolkien's

fantasy epic "The Lord of the Rings". Compare {Iron Age}; see also {elvish} and {Great Worm, the}.

- Glory days: n. Also called the {golden age} of computing. The period of computer history from 1975 -- 1981. This is the era of the computer hobbyist and the Homebrew Computer Club. It was a time when computing was finally brought to the people. The introduction of the microcomputer made it possible for everyone to own and operate their own computer. The golden age began with the introduction of the MITS Altair 8800 and ended with the domination of the IBM PC.
- Dark Age: n. In the history of computing, the period from about 1981 -- present. This is the era were IBM captured and dominated the microcomputer market and then lost control of it, setting computing back an indeterminate amount of time. The world of computing would come to be strangled at the hands of Microsoft, who, like IBM before them, would capture the market with inferior products.
- Renaissance: n., adj. A yet to be determined time in the not to distance future when computing will come out of the Dark Age. A time when it is hoped that computing will return to the people, instead of being controlled and distorted by the popular marketing hype of the day.
- Postmodern Age. n., Sometime in the far future when computers are living systems using nanotechnology and quantum logic.

ARGONNE'S SOFTWARE SHOP R & D

Argonne's researchers have created a wealth of powerful software and models with broad-ranging applications. In addition to helping the U.S. Department of Energy meet its research and development goals, this software can be adapted to numerous other applications.

The Argonne-developed software featured here is closer to commercialization than other software at the Laboratory, which is featured throughout the Laboratory's Web site and available for licensing.

If you are looking for software in or near the "shrink-wrap" phase, browse through these pages to learn whether there is software relevant to your company's interests, and how to explore possible working arrangements, including licensing of the software.

Process Control

MSET: The Multivariate State Estimation Technique is an advanced artificial-intelligence-based early warning system for performance of sensors, equipment and plant processes. This extremely sensitive system detects the smallest developing faults at the earliest possible time and alerts plant personnel well in advance of warnings provided by conventional monitoring systems.

EPICS: Sophisticated control systems for large, complex operations, such as major scientific facilities, manufacturing plants, and storage/distribution facilities, are not readily transplanted from one site to another. Instead, system designers expend vast amounts of time and money to "reinvent the wheel" for their particular facility. Now, a multi-laboratory collaborative effort, in which Argonne is an important player, has produced a system that lets application developers create control systems for any type of facility.

Biotech and Bioinformatics

MAGPIE: The Magpie Automated Genome Project Investigation Environment is bioinformatics software designed to automatically monitor changing sequence data, generate requests to software tools, incorporate results into a growing knowledge base about the genome, and formulate reports on decisions and inferences about the genome.

Computation and Algorithms

ADIFOR: A tool for the automatic differentiation of Fortran 77 programs. Given a Fortran 77 source code and a user's specification of dependent and independent variables, ADIFOR will generate an augmented derivative code that computes the partial derivatives of all of the specified dependent variables with respect to all of the specified independent variables in addition to the original result. See ADIC for C automatic differentiation. Present applications include weather prediction, aerospace vehicle optimization, earthquake ground modeling, chemical reactor modeling, medical drug modeling,and waste and groundwater flow characterization. ADIFOR is available for the following operating systems: AIX, SunOS 4.x and 5.x, HP/UX, IRIX, Linux, and Windows 95/NT.

PCx: A highly efficient code for solving linear programming optimization problems. In addition to being a useful tool for

mathematical computation, the PCx package lends itself readily to a wide array of optimization problems in business and industry, helping decision-makers to find optimal solutions to problems with numerous constraints and variants. With minimal modification, PCx can be applied to solve such problems as resource allocation, diet planning, inventory planning and management,and transportation planning and scheduling.

Geographic Information Systems

GASMAP: A comprehensive geographic information system, contains information never before gathered in one place and organizes it for use by professionals in the natural gas industry. Data include:

- All the government data forms collected by the Department of Energy including the Federal Energy Regulatory Commission and Energy Information Administration, integrated in a common format and linked together
- Spatial data on natural gas pipelines and their respective point
- Energy-related data about cogeneration units, electric utility plants, service territories of local distribution companies, and natural gas storage fields
- Map data on more than 100 interstate pipelines, information on more than 2,000 companies and more than 1,000 variables.

GeoViewer: Imagine searching for a tropical island to retire to (we can all dream). You want to find out what it looks like, how often it rains, the average temperature, the population density, and the costof living. You could fly to each potential choice or you could do a little research on the Internet to narrow the choices. GeoViewer, a new software tool developed by Argonne National Laboratory, could save you significant time and energy in searching for your tropical paradise. Rather than searching separate databases — climate, population, geography — for each location, GeoViewer offers a single, coherent view of large amounts of information, located and presented quickly and efficiently. Real estate and travel agents, land use and transportation planners, geologists and surveyors, emergency planning and response crews, and environmental professionals can all benefit from using GeoViewer. This geographical information system (GIS) provides access to multiple databases and presents them as if they came from a single database.

Information Processing

DIAS: The Dynamic Information Architecture System, provides developers with a flexible software framework for constructing applications and models. It is a general, flexible software framework into which models and information processing applications and databases can be placed. This object-oriented modeling system supports the distributed, dynamic representation of interlinked processes and directly supports the "federation" of existing models to form a simulation system with a wider domain of application than a single model.

The DIAS architecture provides the base for development of the Dynamic Environmental Effects Model (DEEM). This prototype environmental representation simulation framework provides for seamless simulation of atmospheric, space, oceanic, and land surface features.

Internet

LDAP Browser/Editor: If you've ever routed your electronic mail via an on-line address book, or looked up contact information on the Internet, then you've made use of computerized directories. One popular standard used to access directories is LDAP (Lightweight Directory Access Protocol), a subset of X.500. Now there's a tool that makes LDAP directories more easily accessible.

MaDCoW: Working with "intelligent" (or interactive) maps on the World Wide Web can be a costly, complicated business that typically requires sophisticated computer programs, special plug-ins, and highly trained personnel. This has tended to limit the types of organizations that put interactive maps on the Web to large corporations and university- or government-sponsored research institutions.

No longer! A program called MaDCoW ("Maps and Data Coming over the Web"), developed by Argonne National Laboratory scientists, allows the delivery of maps and data over the Web quickly and easily, at far less cost than with typical geographic information systems and special map servers, all without plug-ins.

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ADDRESS SERVICE REQUESTED

DINNER METTING
Tuesday, March 21, 2000
5:00 PM - 8:00 PM
TOPIC:
"Planning Technology for a Competitive Advantage"
NOTE: MEETING LOCATION
Holiday Inn Bloomington
35W & 94th (1201 W 94th St.)

"WHAT'S THE NEW DEFINITION OF A NERD? SOMEONE WHO DOESN'T HAVE A LIFE, JUST INTERNET ACCESS!"

by Earl C. Joseph