

Midwest Gateway Newsletter

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Chapter Business



Chapter Sponsoring Systems Engineering Workshop in St. Louis

by Bob Scheurer and John Schrader

A premier Systems Engineering learning experience is coming to the St. Louis area in the person of Dr. Mark Maier of the University of Alabama at Huntsville. Sponsored by your Midwest Gateway Chapter and hosted by Washington University in St. Louis, the one day workshop is slated for Saturday, October 25, 1997 and will run from 9 A.M. to 5 P.M. Dr. Maier will be speaking on new concepts in Systems Architecting taken from his new book entitled: "The Art of Systems Architecting" (1997). See the following article in this newsletter describing the book.

Dr. Maier received his BS and MS degrees from the California Institute of Technology and his Engineer and PhD degrees in Electrical Engineering from the University of Southern California. While at USC, he held a Hughes Aircraft Company Doctoral Fellowship, where he was also employed as a section head. Currently he is Assistant Professor of Electrical and Computer Engineering at the University of Alabama at Huntsville. Dr. Maier's research interests are in systems architecting, engineering computer based systems, signal processing for telepresence, and radar systems. Dr. Maier is chair of the INCOSE Systems Architecture Working Group.

System architecting is the art and science of developing system solutions. It is that part of systems engineering principally concerned with scoping, conceptualizing, and certification. Systems architects concentrate on initial system definition and design – making use of the systems engineering specialties to develop satisfactory and feasible system concepts and certification for client use. The architectural approach is needed most as systems become more complex and multidisciplinary, and for systems customized to individual clients. This tutorial will cover the concepts of systems architecting; the evidence for a distinct architectural approach; the architect's organizational and life cycle roles; using integrated modeling and heuristics to form and define architectures; and recent developments in making system architecture a recognized profession. This tutorial includes exercises and active involvement on the part of the participants.

The tutorial will be held on the main campus of Washington University in Room 101 of Lopata Hall (College of Engineering). Included in the day's activities will be lunch and an afternoon refreshment break. A handout of the material covered in the tutorial will also be included as a part of the registration fee. Look soon for a flyer accompanying this newsletter which contains specific registration instructions and a registration form. Due to the limited capacity of the room, prior registration will be required.

Midwest Gateway members and professionals with an interest in learning more about systems engineering are invited to attend. This event will be a great way to experience an important aspect of systems engineering which is not often addressed in any detail in systems engineering texts. Because your Midwest Gateway Chapter is working hard to present this as a world class event and an outstanding member value, please make every effort to participate.



Maier's Book Available at Workshop

by M. John Schrader, President

Dr. Mark Maier's book, which he co-authored with Eberhardt Rechtin, will be available for purchase at the **Systems Architecting: Advances and Directions** Workshop being presented by Dr. Maier at Washington University on Oct. 25. The Washington University bookstore is providing the opportunity to purchase this book, entitled "The Art of Systems Architecting," on the day of the workshop for the price of \$45 (plus tax). (The bookstore will be staffing a table outside of the lecture hall until 1:00 PM.)

The book is written for present and future systems architects, for experienced engineers and managers interested in extending their expertise beyond a single field, and for individuals concerned with creating, building, or using complex systems. The text directly addresses the problems inherent in creating and building new and complex systems for electronics, computer, software, aerospace and government purposes. Today's challenges demand that a new class of tools, heuristic and qualitative, be added to the familiar ones of analysis and optimization. Today's Architects must handle the types of systems that are very high-quality, real-time, closed-loop, reconfigurable, interactive, software-intensive, and for all practical purposes, autonomous. **The Art of Systems Architecting** provides these tools by introducing the non-qualitative architectural concepts of systems thinking, heuristics, tensions, feedback architectures, modeling, and progressive design.

The book is divided into three major sections with subtopics as follows:

NEW DOMAINS, NEW INSIGHTS

- Builder—Architected Systems
- Manufacturing Systems
- Social Systems
- Software Systems

MODELS AND MODELING

- Representation Models & System Architecting
- Design Progression in Systems Architecting
- Integrated Modeling Methodologies

THE SYSTEMS ARCHITECTING PROFESSION

- The Political Process & Systems Architecting
- The Professionalization of Systems Architecting

APPENDIX:

- Heuristics for Systems—Level Architecting

Check out the following web site for detailed information on this new book:

<http://www.crcpress.com/PRODS/7836.HTM>

About the Authors:

Eberhardt Rechtin is President Emeritus, The Aerospace Corporation, and Professor Emeritus, Department of Electrical Engineering Systems, University of California

Mark Maier is a professor in the Department of Electrical and Computer Engineering, University of Alabama at Huntsville.

Next General Membership Meeting

by John P. Adrian, Programs Chair

The next general membership meeting will be on October 2, 1997 in Boeing's Building 270A (located at the intersection of McDonnell Boulevard and I-270) Level 1 A—Wing Room 108 at 5:00 P.M. The agenda includes Ken Kepchar's INCOSE 97 symposium paper presentation entitled "Balancing Requirements and the Product: A Process and Tools Case Study." In addition, an overall review of the symposium by the attendees (i.e., Scheurer, Schoening, Kepchar) will be conducted. A discussion of the upcoming October workshop with Dr. Mark Maier is expected. Refreshments (soda, cookies, chips, etc.) will be provided by the Chapter. Please contact John Adrian at (314) 233-2755 for additional information or for access to the facility.

President's Corner

by M. John Schrader, President

All of the events sponsored by the Midwest Gateway Chapter of INCOSE are underwritten in part by a portion of your membership dues. When you pay membership dues to INCOSE, a portion of those dues are returned to the local chapter to provide learning opportunities for the local chapter membership. Your chapter has been doing that this year and will continue that practice in the future. Throughout this newsletter, you will be informed of several events which your board is providing for you during the remainder of this calendar year.

In this issue of the Midwest Gateway Chapter Newsletter, there are a number of articles describing a one day tutorial sponsored by our chapter to be held at Washington University on October 25 featuring Dr. Mark Maier. (Dr. Maier's background will be described in the article detailing the tutorial event.) At the 1996 INCOSE Symposium in Boston, I was able to hear two of Dr. Maier's papers and found his presentation style to be both entertaining and informative. Our chapter is indeed very fortunate to be able to sponsor this workshop. Please make every opportunity to attend the tutorial on October 25 which I consider to be the highlight event of our chapter this year.

Attendance at the events sponsored by our chapter have been very disappointing. Your board has initiated two actions in an attempt to remedy this problem. We are currently working on a questionnaire to send to our membership to determine what type of program or events our chapter could sponsor to meet your needs and interests. Secondly, we will be starting a telephone network to personally remind you of upcoming events. Should you have any immediate input, please don't hesitate to call either me, John Schrader at 232-6430 or Bob Scheurer at 234-1608.

It's election time again! A nominating committee led by Ken Kepchar, your Past-President, is in the process of putting together a list of candidates for the offices of President-Elect, Treasurer, and two Directors. If asked to be a candidate for any of these positions, please give it careful consideration. Our chapter is fortunate in having ample funding for programming. We do need idea people and people who are willing to make those ideas a reality for the betterment of our chapter and its members.

Your board has also initiated conducting a seminar at the University of Illinois to provide an opportunity of students there to learn about Systems Engineering

and INCOSE. Bill Schoening who is the current President of INCOSE has agreed to work with Ken Sivier, a professor at the university and currently a Midwest Gateway Chapter board member, in conducting this seminar. Thanks to Ken for his patience in our sponsoring of this event and Bill for his willingness to participate.

The final reminder I would like to pass along is that the deadline for submitting draft papers for the INCOSE Symposium which will be held in Vancouver, B.C. Canada next year is 15 Nov. 1997. At the 1996 Symposium only one of our members, Ken Kepchar, presented a paper which he and Bob Scheurer co-authored. We are all aware that the lead time required is somewhat of a drawback, however if you have any Systems Engineering topic of interest, we encourage you to submit a draft copy to the International Office by 15 November. Additional information is provided on the INCOSE home page.

Survey of Members Planned

In order to get a better idea of our member's interests and desires, the Midwest Gateway Chapter will be conducting a membership survey. Please watch your mail for this important communication arriving in the next few weeks. Your feedback will help with providing better value in your membership and form the basis for next year's planning.

InterNational NewsWatch



A Personal Perspective of the LA Symposium

by Bill Schoening, International President-Elect

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INCOSE and its International Symposia continue to grow and mature. Ten percent of the approximately 870 attending were from outside the US. An increasing number of papers reflect a commercial background vice military, a trend that I believe is very healthy.

Many of you remember Bill Wittig, the second president of our chapter and now working for Delphi Steering, a division of General Motors in Saginaw Michigan. Bill's paper was voted Best by the reviewers

in the Systems Engineering Applications category. Ernst Fricke presented a case study of a small construction firm in Munich that builds parking garages. Ernst's examples of how it was done before his SE team got involved were very instructive.

Nearly half of the attendees participated in a tutorial or the International Round Table. The tutorials have been major successes over the last several years, and a number of attendees have said they want to attend several. So we are making plans to add an additional day of tutorials in Vancouver in 1998.

The downside of being the President Elect is that I get to spend less time attending presentations and visiting friends and more time working with people from around the world who are trying to organize INCOSE chapters. We finalized the German chapter, and I spent time with Swedes, French and Koreans.

For those of us from the new Boeing Company, there were 60 of us in attendance, a clear demonstration of the commitment of The Boeing Company to INCOSE. It is also very encouraging to encounter the very same Systems Engineers that we work with in our supplier's organizations. The implied commonality of purpose and approach will benefit us all.

After six days of intensely stimulating activity, I left LA very proud of the organization to which I belong, proud of the people who run it, and proud of the people who are its members. On those occasions when we ate dinner in local restaurants, it was common for people overhearing our conversation to come ask who we are and what we do. And they stayed for more than just a polite minute to hear our answers.



Tour of Jet Propulsion Laboratory a Highlight of the 1997 Symposium

by Bob Scheurer, President-Elect

Having an opportunity to see where deep space missions are conceived, planned, developed, and executed proved to be my personal highlight of the 1997 INCOSE Symposium in Los Angeles. The tour displayed a dramatic example of successful systems engineering in progress. With the Mars Pathfinder mission still highly visible in the media, several of us experienced first hand the marvels of innovation and some benefits of taking risks at the JPL.

Our tour of the JPL consisted of four stops. Stop one involved an overview of the radical changes experienced by the Lab over the past several years as funding

cuts and competition forced change and innovation. Stop two focussed on the mission planning process, where "top level" scientific objectives are distilled into simulated missions and requirements documents. Stop three discussed the elaborate design and development process, involving more detailed simulations, design allocations, and prototype development -- in an integrated, paperless environment. Finally, stop four was in the testing lab where new concepts and prototype hardware/software are exercised in both real and simulated environments.

Needless to say, the tour was very educational and intriguing. Because the Pathfinder mission has proven to be such a success, NASA (one of the customers) and the JPL believe the stream-lined approach to engineering space systems using systems engineering methods and tools is the future happening today. To see a glimpse of this new way of thinking, check out the JPL's web site at: <http://www.jpl.nasa.gov/>



On Being a Leader

by Bob Scheurer, President-Elect

One of the invited speakers at the symposium in Los Angeles was Dr. Warren Blank, noted author and expert on leadership. Adapted from his book "The Nine Natural Laws of Leadership," Dr. Blank provided a workshop with insights on how to be a leader.

According to Blank, the most important quality of being a leader is being acknowledged as such. "The real miracle of leadership is that multiple, localized events transform groups and individuals into leaders every day, hour, and minute." Dr. Blank used case studies taken from popular films such as Apollo 13 to emphasize his points. He cited examples where common people rose to the occasion to become leaders of the moment.

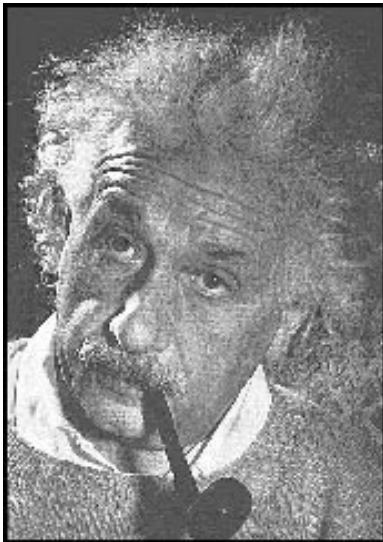
Dr. Blank went on to point out that being a successful leader often involves "working the web." This means that you have to sell someone who can sell

someone else. To gain their support, you will have to communicate your direction, create shared meaning, and meet followers at their level of understanding. He also reminded everyone that “what gets rewarded gets continued.”

One of his laws of leadership involves developing the leader within. Here he advises to analyze your strengths and weaknesses, examine how you are processing information, map the territory and chart a course, and perceive what others don't. To assist with this, he offered an acronym called GAP, “Gain Another Perspective.”

In charting your course and attaining your goals, Dr. Blank offers these words of advice: 1) Use the strategic “one at a time” rule; 2) Rely on the 3 P's to develop skills (i.e., Practice, Practice, Practice); 3) Make mistakes learning events; and 4) Just do it.

Feature Article



Einstein's Words to Live and Work By

The following is a list of quotes on four different areas of life as a professional. They were provided by Dr. Arden Bercovitz, Ph.D., as he impersonated Albert Einstein at the 1997 Symposium banquet.

on Creativity and Innovation:

- Creativity is seeing what others see and thinking what no one else has thought.
- Never let yourself be seduced by any problem, no matter how difficult.
- I simply imagine it so, then go about to prove it.

- Imagination is more important than knowledge.
- Have the courage to take your own thoughts seriously, for they shape you.

on Leadership and Management:

- Love is a better teacher than sense of duty.
- Setting an example is not the main means of influencing another, it is the only way.
- Try not to become a person of success, but rather, to become a person of value.
- External conditions can, to a certain extent, reduce, but never cancel individual responsibility.
- For me, a simple message: To think and act with courage, independence, and imagination.
- The only sure way to avoid making mistakes is to have no new ideas.

on Diversity and Team Building:

- The world as we see it is only the world as we see it. Others may see it differently.
- Any society which does not insist upon respect for all life must necessarily decay.
- My political ideal is democracy. Let every man be respected as an individual and no man idolized.
- As long as I have any choice in the matter, I shall live only in a country where civil liberty, tolerance, and equality of all citizens before the law prevails.

on Change Management:

- Problems cannot be solved at the same level of consciousness that created them.
- Genius simply cannot be reduced to a set of rules for anyone to follow.
- My only genius talent is inquisitiveness.
- Common sense needs constant reappraisal.

Anonymous Quote from the 'net:

*Play with hardware long enough and it will break;
play with software long enough and it will work!*

If you would like to contribute to the Newsletter with a

- *Personal Commentary*
- *Feature Article*
- *Book Review*
- *Cartoon*

or any other article, contact the editor listed on the front cover of this newsletter. Your comments and suggestions on any Systems Engineering topic are most welcome!

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