

TEAM-Like Workshops in Related Areas: Cooperation in Modeling for Competitive Industries

Larry R. Turner

RECEIVED
JAN 18 2000
OSTI

Abstract—The TEAM Workshops originated from problems in fusion research. Based on his recent observations regarding automotive modeling, the author asks whether TEAM-like workshops, and the accompanying cooperation among modelers, are of value in areas of economic competition.

I. COMPETITION AND COOPERATION

In her study of advanced automotive government-industry cooperative programs, Melissa Polverini [1] compared the Advanced Clean Energy Project in Japan, the Car of Tomorrow in Europe, and the Partnership for a New Generation of Vehicles (PNGV) in the USA. The Advanced Clean Energy Project assigned individual appointments to each company. That meant the companies needed to share little or no research information. The Car of Tomorrow is to come up with only one car design, which will then be put into production. Because of that, the companies have to share information, which for competitive reasons they don't want to do, resulting in delays for the program. The PNGV attempts something in between. The companies work together on pre-competitive issues, but in the vehicle engineering phase, they act independently.

I talked about this earlier this week in my panel presentation on PNGV modeling [2]. This morning let's think about cooperation in competitive industries. In particular, consider what role TEAM or TEAM-like workshops can play in this process.

II. A VOLATILE MEETING

What got me thinking about this was a particular PNGV Technical Team meeting. Each Technical Team has members from the "Big Three" US automakers, from government agencies, and from the national laboratories [3]. This particular meeting was a meeting of the Systems Analysis Team, who are responsible for developing modeling tools and encouraging the other teams to do

modeling. Members of other teams were also present as well as other people with broader responsibilities within PNGV.

Every year the Peer Review Panel from the National Research Council [4] recommends cost modeling for PNGV, and every year the automakers demur. But this particular meeting was about modeling something else, modeling that the PNGV secretariat and the US Department of Energy (DOE) had been pushing for. The modeling had finally been done, but was badly flawed because it was based on bad assumptions. Because of these bad assumptions, the results from the modeling were a clear-cut "The bigger, the better" or "The smaller, the better." Even if the modeling had been done correctly, the results would be controversial because the different automakers had each been promoting different choices.

The modelers and those of us from the Systems Analysis Technical Team believed the purpose of the meeting was to provide better assumptions, so the modeling could be redone. Instead, some of the industry people questioned the need for cooperative modeling, saying their in-house, proprietary modeling tools were far better, and could provide all that was needed.

This sort of response is not unique to the auto industry. A week ago, representatives of another industry visited Argonne National Laboratory (ANL), and a number of us gave presentations on our capabilities. Again, the industry people spoke of their superior in-house tools. This is just one example of the general process. Chapman [5] reports what works well in that situation: "The industry personnel enlightened the lab scientists about the conditions under which the device (or process) might be adapted for automobile production. This broadened the industry personnel's perspective on the range of new technology that might be applied to a problem. At the same time, the laboratory personnel were exposed to real-world manufacturing considerations; they thus narrowed their field of inquiry." By contrast, what doesn't work is when the laboratory scientist, unfamiliar with an industry, claims to have the solution to all the industry's problems.

III. THE STORY OF TEAM

At this point I told the story of the origin of the TEAM workshops and problems [6]. TEAM originated from the

Manuscript received 22 November 1999. This work was supported in part by the U. S. Department Energy, Office of Advanced Automotive Technologies, under Contract No. W-31-109-ENG-38.

The author is with the Energy Technology Division, Argonne National Laboratory, Argonne IL 60439. (email: larry@anl.gov)

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, make any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible
in electronic Image products. Images are
produced from the best available original
document

needs of the fusion community. In 1985 it was clear that existing 3-D eddy-current codes were inadequate to model effects such as the forces on components of fusion reactors due to plasma disruptions. On a rainy evening during COMPUMAG-Colorado, more than 60 people gathered in a meeting room on the Colorado State University campus to express their interest in the undertaking. The first TEAM Workshop was held the following March at the Rutherford Appleton Laboratory. Solutions to several of the problems were presented, even though some of the presenters had only received the problems two weeks before. That October, the first workshop in Japan was held at the Tokyo Electric Power Company. There Akihisa Kameari summarized the Japanese solutions to all six problems. To me, the success of TEAM was assured at that point.

IV. "NOT A SHARED VISION"

I also told the Technical Team meeting that the effect of the TEAM workshops and problems had been to improve the competency of the electromagnetic modeling community. I felt that a similar effort could raise the overall competency of the automotive modeling community. I saw a couple of people from the automobile industry talking together, and one of them spoke up: "That is not a shared vision. Why should we support an effort whose only effect is to decrease the comparative advantage of our own in-house modeling? It's all very well to speak of fusion, but fusion is not a field of industrial competition."

I had to admit she had a point. During a visit to Europe about twenty years ago, I heard about a proposal for cooperative research in fusion, evoking the example of CERN. (CERN has always been praised as an early example of European cooperation.) But some opposed this kind of cooperation on fusion: "It's all very well to speak of CERN, but high energy physics is not a field of commercial competition. We're talking fusion. Every European country will want to have its own fusion industry."

V. WHY I'M HERE

After that meeting, I thought about modeling in competitive industries, and about the differences between electromagnetic modeling and automotive modeling. I asked Nathan Ida, international TEAM chairman, whether it would be worthwhile to talk about this issue at this TEAM Workshop. He said yes, but he thought it should have a wider audience—like COMPUMAG. I asked Bill Trowbridge, president of the International Compumag Society, if he agreed with Nathan. In response, he invited me to be on his COMPUMAG panel, to talk about joint industry-government projects and about cooperation in competitive fields.

That's why I'm here raising the question: Is TEAM or a TEAM-like program of problems and workshops of value in an area of economic competition? I remember COMPUMAG, if not TEAM, always had the strong support of Tom Preston at GEC and Simon Polak at Philips. Perhaps some Japanese experience may be relevant here. Yesterday morning at COMPUMAG there was a

presentation about a benchmark problem on thin-film write heads [7], surely a competitive field. It might be useful to know how this problem was developed and whether workshops have been held for the discussion of problems like this one.

I'd like to know what the rest of you think about this topic.

VI. REFERENCES

- [1] Melissa Polverini, "International PNGV-Equivalent Programs: Where does the United States stand?" Paper 1999-01-1308, Presented at the SAE International Congress, March 1999. Available from the SAE Bookstore, <http://www.sae.org/products/papers/1999-01-1308.htm>
- [2] Larry Turner, Robert Larsen, Michael Duoba, Scott McBroom, Ashok Nedungadi, Keith Wipke, "The Role of Industry and Government in Shaping New Problem areas: The Example of Modeling Future Automobiles," Presented as part of the Panel "Future Trends in Numerical Modeling," COMPUMAG-Sapporo, 24- 28 October 1999. To be published in *COMPTEL*.
- [3] Robert M. Chapman, *The Machine That Could: PNGV, a Government-Industry Partnership*. (Santa Monica CA, 1998, RAND) pp. 20-22.
- [4] Standing Committee to Review the Research Program of the Partnership for a New Generation of Vehicles, *Review of the Research Program of the Partnership for a New Generation of Vehicles: Fifth Report*. (Washington DC, 1999, National Academy Press) pp. 57-58
- [5] Robert M. Chapman, *op. cit.*, pp. 33-34.
- [6] A short history of the TEAM Workshops and Problems through 1990 can be found at <http://www.aps.anl.gov/techpub/lsnotes/ls153/ls153.html>. For current Team Problems and summaries of recent workshops, see <http://ics.ascn3.uakron.edu/team.html>.
- [7] Koji Fujiwara, Fumiaki Ikeda, Akihisa Kameari, Yasushi Kanai, Kimio Nakamura, Norio Takahashi, Koji Tani, and Takashi Yamada, "Thin Film Write Head Field Analysis Using a Benchmark Problem," Paper presented at COMPUMAG-Sapporo, 24- 28 October 1999.

The submitted manuscript has been created by the University of Chicago as Operator of Argonne National Laboratory ("Argonne") under Contract No. W-31-109-ENG-38 with the U.S. Department of Energy. The U.S. Government retains for itself, and others acting on its behalf, a paid-up, nonexclusive, irrevocable worldwide license in said article to reproduce, prepare derivative works, distribute copies to the public, and perform publicly and display publicly, by or on behalf of the Government.