Modeling & Simulation Saves Money

As President and co-founder of The AEgis Technologies Group, Bill Waite directs its staff in delivering a wide variety of modeling and simulation (M&S) products and services. Mr. Waite has more than 30 years of professional hands-on experience in all phases of the M&S life cycle and currently is active in the evolution of the M&S profession, industry and marketplace.

Questions prepared by Alabama Modeling & Simulation Council

Many of the readers probably do not know much about modeling and simulation. Can you give us a brief description of modeling and simulation, its uses and benefits?

Modeling is representing something of interest (formally called the 'referent') in some convenient way. Simulations are models that 'act out' the behaviors of the referent over time. A model may be as simple as a diagram, picture or scale model or as complex as the set of mathematical equations that describe a missile in flight or the nature of the economy. Simulations are typically implemented in computers, sometimes with the aid of additional hardware of the participation of real people. Familiar models are the 'wire frame' models of crystal structures common in chemistry classes. Familiar simulations are those used to predict the paths of hurricanes, or interactive video games in which the participant plays one role, and other role-players' behaviors are simulated. Models and simulations may be used for analysis, engineering, training or to support the operation of an organization or equipment. The principle benefit of simulation is its intrinsic flexibility and economy. For instance, simulations can be developed at a variety of levels of detail and scope depending on what job they are expected to be used for, and they may represent in accessible form features
of the referents that are not normally available, such as the temperature at the center of the earth. Simulation is often used as a substitute for something that would be very expensive or not achievable at all in the real world. Many simulation experiments may be made for the cost of only one missile flight or clinical trial, and simulation is by far the best way to reduce the implications of nuclear war, the next epidemic or the next severe economic downturn.

**What was the reason for creating the Alabama Modeling and Simulation Council?**

Modeling and simulation is a rapidly emerging new information-industry, like process control or the software industry, though somewhat less mature. Alabama, in fact, boasts some of the world’s best talent and institutional capability in modeling and simulation. The Alabama Modeling and Simulation Council was formed to provide a forum for collaboration among Alabama’s modeling and simulating community of practice, and to serve as a vehicle for the Alabama M&S community to cooperate and compete in the emerging world-wide M&S industry.

**How do you see the AMSC supporting the modeling and simulation industry in Alabama?**

The agenda of the AMSC has four components: Technology, Professional Development, Industrial Development and Business Practice. The AMSC serves to bring new technical information, tools and practices to the state and to make them readily available to the local community. At the same time, it supports the communication of the cutting-edge technology being developed in the state to other users and customer communities worldwide. In the area of professional development, the AMSC helps identify needs for workforce development and professional development training and education. It cooperates with — sometimes leads — the international community in clarifying the M&S body of knowledge, in establishing guidance for educational and training curricula, in producing and delivering educational material. The AMSC also influences professional certification activities and supports Alabamians in achieving
such certification. The AMSC is already cooperating with the U.S. Department of Commerce to establish industry and job labor code designations for M&S companies and individuals. Finally, the AMSC is acting to influence business practices whereby M&S is used to support such other activities as enterprise operations, product evolution, and material acquisition – particularly in association with the federal government and the Department of Defense.

What have been some of the activities of the AMSC? What are the future plans of the AMSC?

The AMSC has held two yearly conventions at which prestigious guests from the M&S community were invited to address trends in the industry and at which Alabama simulationists reveal some of the more remarkable successes of application of the technology. AMSC also co-sponsors the annual Huntsville Simulation Conference. More important in many ways, however, are the activities of the AMSC operating committees. The Technology Committee, for instance hosted a workshop on techniques related to development of simulations into more powerful and flexible ensembles. The effort brought together local experts with representatives from the DOD’s Defense Modeling and Simulation Office. The Professional Development Committee has been supporting local universities to establish continuing-education professional-development curricula and certificates and to initiate a mechanism for the posting of readily available tutorial material on the AMSC web site. The Industrial Development Committee conducted a very valuable and revealing initial survey of the presence of M&S activity in Alabama. The Business Development Committee has begun to explore how the AMSC can improve the opportunities for Alabama M&S businesses in ways that are fair and that do not interfere with the normal corporate business practice.

What do you see as the likely growth paths for modeling and simulation within the Alabama business community. And how will the heavily military focus of M&S applications and the AMSC membership translate in the non-DOD arena?
Uses of M&S (Industry)

Question: Does your company use M&S for:

- Engineering: 86%
- Analysis: 90%
- Testing: 61%
- Training: 35%
- Life-cycle Cost: 35%
- Other: 18% (SBA, process)

(n = 84 companies)

M&S Developer/User (Industry)

Revenue directly derived from development of computer modeling/simulation products:

- 73%

Revenue directly derived from application and analysis of computer modeling/simulation products:

- 86%

Revenue from both development and user of modeling/simulation products:

- 60%

(n = 84 companies)

Development of Alabama M&S Industry

Question: Year facility established in Alabama?

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(60% growth in 10 years)

Excludes federal organizations and universities

What results of the recent modeling and simulation survey surprised you the most?

Naturally the number and variety of organizations and individuals identified by the survey as actively engaged in modeling and simulation was gratifying.

I was surprised and pleased to see the number of small and medium sized companies emphasizing modeling and simulation. This demographic indicates, I think, the fundamental viability of the M&S industry in Alabama.