



REPORT for Second Meeting of Modular Design of Simulation Tools (MOTTO) Working Group on 13.07.2004

Location:

Wroclaw University of Technology, Wroclaw, Poland
B-4 building
Lukasiewicza 3/5
50-371 Wroclaw

Goals of the meeting:

the meeting was organized first to discuss the White Paper, that was written as the result of MOTTO group activities as well as remarks of designated reviewers. A constructive criticism and improvement suggestions were expected from the participants. Second, the meeting served discussing the way forward, especially regarding future possible project focusing on development an universal data exchange format for simulation tools.

Participants:

1.	Professor Edward Chlebus (EC)	Centre for Advanced Manufacturing Technology (CAMT), Poland
2.	Jaroslav Chrobot (JC)	Centre for Advanced Manufacturing Technology (CAMT), Poland
3.	Slawomir Susz (SS)	Centre for Advanced Manufacturing Technology (CAMT), Poland
4.	Nikolay Zlatov (NZ)	Manufacturing Engineering Centre (MEC), University of Wales, Cardiff, U.K.
5.	Jyrki Peltoniemi (JP)	VTT Technical Research Centre of Finland, Industrial Systems, System dynamics group
6.	Peter Steininger (PS)	ifab-Institute of Human and Industrial Engineering, Universität Karlsruhe (IFAB), Germany

Short description of the meeting

The meeting took 1 day. During the first part of the meeting the White Paper was presented by the chairman and discussion regarding its contents and reviewers' remarks took place. The participants agreed the improvement needed for the White Paper and the chairman has promised to correct it and submit to Sim-Serv Core Team again.

During the second part of the meeting an idea of a common project on universal data exchange format for simulation tools was presented by the chairman and discussion regarding possibilities and hindrances for such a project took place.

Unfortunately other active group members (prof. Terrence Perera (Sheffield Hallam University) and Tingting Zhu (CIMRU)) couldn't come because of urgent work.

13.07.2004, 10:00 – 13:00

During the first part of the meeting the White Paper was presented by the chairman and discussion regarding its contents and reviewers' remarks took place. While White Paper presentation the participants had some remarks to the White Paper and the situation in the market regarding data exchange between simulation tools:

- **JP:** most answers for the MOTTO web survey came in fact from discrete event simulation area,
- **NZ:** for customers the idea of modular simulation tools is great, but for vendors it could be not particularly profitable,
- **PS:** we can observe a market pressure on data exchange between simulation tools and engineering tools; an example could be that DELMIA is going to build a central database for its products for data exchange; Daimler-Chrysler tends to have a possibility to simulate a whole factory (within Digital Factory project); DELMIA started a project with TECNOMATIX for data exchange between their products,
- **PS:** although there is already the HLA standard for data exchange, mostly designed for military applications, but it is not widely used,
- **PS:** the wishes of vendors are that vendors want to buy another vendors and dominate on the market,
- **NZ:** there is a software package called GAMBIT for continuous simulation and it is not exchangeable at all,
- **PS:** em-Workplace in Germany is mostly used for modeling interaction between human workers, not for robotics,
- **JP:** open format for graphics for continuous simulation software could be beneficial (nowadays this is not available),
- **PS:** we could think about HTM-like exchange format for graphical representation,
- **PS:** we should consider two data views: on-line and off-line data exchange,
- **PS:** HLA standard for data exchange is widely used in China, Japan, United States (Department for Defense)) and it doesn't define data format for simulation models; Fraunhofer Institut in Magdeburg (prof. Schenk) deals with HLA, as well as Polytecnico di Milano (they have developed simulation software that uses HLA standard); few software tools support HLA (for example DELMIA, but only in software designated for United States),
- **PS:** we should consider, which is the goal for such data exchange; HLA has its limitations,
- **JP:** vendors are aware of the situation, that data exchange between simulation tools is necessary (Airbus and Daimler-Chrysler have started already projects for data interchange),
- **PS:** General Motors (especially Opel) wishes, that human simulation is possible to run for 2-3 years experiment, but nowadays systems are capable to run simulations for 2-3 minutes (the thing is to analyse for example lifting weight causes – how to aggregate such data and how influences it has on future worker health);

Further the question was how to improve the White Paper. Meeting participants came to a conclusion, that the following changes should be undertaken:

- paper title should be changed to “Modular Design and Integration of Simulation Tools”,
- introduction should be extended with an explanation for modular approach for modeling; maybe 2-3 paragraphs would be enough for explanation of the idea behind,
- we should more emphasize, why particular tools were chosen for benchmarking for better justification of the choice (we cannot benchmark all of the tools available),
- 75% tools which were benchmarked are well known in the market and we have bold them in the White Paper; this is a snapshot of today and tomorrow it can be changed.

Meeting participants have also some remarks to further steps after the White Paper is published on the Sim-Serv web site:

- **PS:** do we become some feedback from the Sim-Serv web site who has read the article; is there a mechanism for such an analysis?

The participants agreed the improvement needed for the White Paper and the chairman has promised to correct it and submit to Sim-Serv Core Team again till the end of July.

13.07.2004, 15:00 – 17:00

During the second part of the meeting an idea of a common project (CRAFT, STREP) on universal data exchange format for simulation tools was presented by the chairman and discussion regarding possibilities and hindrances for such a project took place.

Meeting participants have agreed, that the project will cover different technical views: Simulation Approach, IT Science and Transfer of Research Results to Industry. We have to consider different views of simulation data exchange (off-line (file based) and on-line (handshake procedures)).

The idea of the project would be first to find an user (there are such large companies), who uses different simulation tools for different purposes (maybe on different company levels) and devotes work for modeling the same things in different tools. Then the vendors of the software should agree to produce interfaces linking their format to the universal simulation data exchange format developed within the project.

We should consider rather European tools, than American (Tecnomatix comes from Israel, which is an associated region for EU). The other examples are Corporate Modeller (U.K.), Dosimis-3 (Germany), DELMIA. The vendors don't have to inform about their specific formats.

The results of such a project should be academic (the universal simulation data exchange format) – more methodology than development. The result should be: (1) method how to describe process, (2) description of an open data exchange format.

Meeting participants have also some remarks to steps before the proposal is made:

- **PS:** GARTNER GROUP collect data regarding using of simulation tools and we could have a look at the surveys to have more arguments for our project.

At the end of the meeting the chairman promised to analyse, where the project could fit among different EU calls (CRAFT, STREP) and inform all of participants.