



## European Material Modeling Council (EMMC)

### Soft-Ware Owners working group (SWO)

#### Background

The development of new materials and their optimal use across industries is a significant innovation driver and a key factor for the success and sustainability of the industry and European society in general. Large and small companies rely on numerical simulations to effectively and efficiently design and engineer new products, and thus minimize the need for prototyping and testing. Numerical simulation in industry is mostly dominated by Structural Mechanics (SM) and Computational Fluid Dynamics (CFD) solved by Finite Element or Finite Volume Analysis, and forms part of the Product Lifecycle Management/Computer Aided Engineering (PLM/CAE). This simulation of manufacturing processes, devices and products started more than 50 years ago, is mature and served by a limited number of multi-billion dollars software companies.

The parameters in the SM or CFD models are mostly determined by experiments. As a consequence, the influence of the chemical material structure and its macroscopic performance in the end-product is usually missed! More and more companies have recently started using electronic/atomistic/mesoscopic materials modelling to include more detail in their simulations. With the increasing importance of materials for the European competitiveness and sustainability, it is urgent today to develop the materials modeling community and software tools and to mature these tools for an effective and efficient use across various industry sectors and application areas.

#### Scope

Accordingly, the scope of the work group entails the development and implementation of methodologies to transfer developed materials models to the manufacturing industry. Special attention will be given to integrate electronic, atomistic and mesoscopic models into continuum models.

Participants will be materials models software owners who are licensing their code, and who are thus actively transferring their software to third parties. This includes academic software owners who offer their software freely as open source code, and proprietary software owners who sell their software to industry.

#### Objective

The objective of the SoftWare Owner (SWO) working group of the EMMC is to gather the key representatives of the academic and industrial software owners to discuss, prioritize and communicate the needs of the software owners. Bottom-up activities may be started and input will be given to funding schemes a.o. to the European Commission in order to help developing policies and programmes.



## Goals

The ultimate goal is that materials modeling and simulation will become an integral part of Product Life Cycle Management in European Industry, where the desired performance of the end product is met by designing the material from the electron up!

In order to achieve this objective, the software owners will :

- Identify the key Strength, Weaknesses, Opportunities and Threats (SWOT) of materials models in the manufacturing industry;
- Identify how software owners can help boost the competitiveness of the European industry;
- Reflect on how academic software can be transferred to the manufacturing industry. Licensing policies and documentation will be discussed and recommendations made.
- Brainstorm about how the software owners can be strengthened and leverage the efforts of the modelling community to capture the biggest possible opportunities.
- Identify where the current policies and programmes are supporting the academic and proprietary software owners and where there are gaps;
- Articulate and prioritize a set of recommendations to funding schemes, a.o. the European Commission, for shaping futures policies and programmes aimed at closing the gaps.
- Complete the software working group to represent the industrial and academic software owner community and act as a sounding board;
- Interact with the manufacturing EMMC workgroup;
- Interact with the large constituency of academic modellers and stimulate them to produce software that can be transferred to industry.

## Desired outcome

The main outcome is to constitute a representative SWO team; to assemble, organise and present the needs of academic and proprietary software owners; to transfer materials models into the manufacturing industry.

## Timeline

Completion of a Road Map by end Q1 2015

Continuously: Expanding database to reach a representative network, with an active core (the team)

Sept 2014: Input to the request for sharing of ideas sent by EC. This request will be sent to the existing list of companies and will have this Charter as attachment

September 2014: First draft Road Map as discussion paper for November meeting by core team

October 2014: Invitation to November meeting of active contributors by EC

November 2014: Report on outcome of the wide consultation

December 2014: Second version Road Map

## Provisional team members

Roger Assaker – e-Xstream engineering

Anders Blom – QuantumWise



## The European Materials Modeling Council

We are looking to complete the core team. Do not hesitate to contact us if you are interested in becoming an active member of the SWO core team.