



# EMMC-CSA

European Materials Modelling Council

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**Network to capitalize on strong European position in materials modelling and to allow industry to reap the benefits**

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**Duration: 36 months**

## REPORT ON THE EXPERT MEETING ON TRANSLATION

<b>Date</b>	June 28, 2017
<b>Venue</b>	DPI Office, Eindhoven, The Netherlands

<b>Organiser</b>	Denka Hristova-Bogaerds, DPI
<b>Contributing beneficiaries</b>	EMMC-CSA partners



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**TABLE OF CONTENT**

**1. EXECUTIVE SUMMARY..... 3**

    1.1 General description and objectives ..... 3

    1.2 Major outcome..... 3

**2. REPORT OF MAIN ACTIVITIES..... 4**

    2.1 SMEs vs. Large enterprises..... 4

    2.2 Translation Process ..... 4

    2.3 Skills of the Translator role ..... 5



## 1. Executive summary

### 1.1 General description and objectives

During the EMMC International Workshop 2017 in Vienna, the topic of Translation brought a lot of attention, discussions but also many questions mostly related to the role and the necessary skills of the translators.

Therefore an EMMC-CSA Expert Meeting was organized to give focus to these discussions and to try to outline the profile of a translator.

The discussion points were:

1. Summary and conclusions from the EMMC International Workshop 2017 in Vienna
2. Role of the Translator: what is expected from the Translator, positioning between science and business, company internal and -external translators ...
3. Translators profile: which skills should a translator possess( capability to estimate investments vs. benefits of modelling, capability to give neutral advise with several workflow options), ...
4. Tools of the Translator: databases of software, modellers, training, possible coming call of EU on OTE...
5. Summary of the discussion: focused profile and role of the Translator, to be endorsed by the Translators Working Group of EMMC, EU and broader community.

#### Participants:

Javier Llorca	(IMDEA, Spain)
Peter Klein	(Fraunhofer ITWM, Germany)
Katya Vladislavleva	(DataStories International NV, Belgium)
Merja Sippola	(VTT, Finland)
Antoine Schlijper	(Novidec, UK), via WebEx
Denka Hristova-Bogaerds	(EMMC-CSA, DPI, The Netherlands)
Alicia Marcos Ramos	(EMMC-CSA, DPI, The Netherlands)
Luca Bergamasco	(EMMC-CSA, Polito, Italy), via WebEx
Daniel Höche	(EMMC-CSA, HZG, Germany), via WebEx

### 1.2 Major outcome

The major outcomes from this expert meeting were:

1. give feedback and focus to the discussions during the EC workshop on Translation in September 2017 in Brussels and
2. contribute to the preparation of the Translators Guide



## 2. Report of main activities

A summary of the topics discussed during the meeting is presented below.

### 2.1 SMEs vs. Large enterprises

Most of the people fulfilling the Translators role (including the present at the meeting) currently don't work extensively with SMEs because:

- The people in SMEs usually have hands full with their normal daily work and have little time for research
- SMEs cannot take risks related to present modelling capabilities
- SMEs problem tend to be more specific
- SMEs do not have the required expertise
- It is not always possible for SMEs to take very challenging projects
- SMEs usually cannot afford it: financially and commercially not possible
- SMEs are generally less organized for R&D and require more complete support

However if SMEs are to implement/utilize more widely modelling, they are the ones that will have the strongest need for translators. It was acknowledged that performing translation for SMEs may require more efforts than translation for large companies since SME's usually need a more integrated problem solving approach which includes non-modelling issues. Challenges for SME's usually include elaborations and explorations of material data space issues not directly connected to modelling.

Beneficial and often preferred cases are when several SMEs are involved in joint projects with large companies. Such projects are often the most successful and profitable projects. Short pilot projects including SME and larger companies might accelerate materials modelling application in SMEs

The translation process and the skills of the Translators working for large companies and for SMEs may differ. Specifically, SMEs and large companies have different timeframes for investments: SMEs are faster in taking decisions than large companies and their problem often requires rather broad knowledge/expertise and soft skills from the Translators. Translation for large companies may require also specific/deep knowledge and understanding of modelling.

It is difficult thus to combine all requirements in one single person skills. Therefore, a Translator is not an individual person but is a role which is usually best fulfilled by a team of people with skills required for the efficient execution of the Translation process.

The Translator role may differ in terms of required skills, depending on the specific case/client. The skills required for the Translator role are discussed below in more detail.

### 2.2 Translation Process

- 1) Good understanding of the business case: impact, profit, risks, timeline of the client
- 2) Good understanding of the industrial case: where and what exactly is the problem: material, processing related or other origins, respectively factors that have an effect e.g. technical specifications.
- 3) Analysis of the experimental data available within the client, which is needed and can be used for model input and validation. The quality and accuracy of this data must be well



understood. If necessary, the Translator can propose “dedicated experiments” if available data is limited.

- 4) The earlier steps determine the translation to more than one modelling solutions/workflows. The following factors are considered and often requested to be provided by the Translator to the client:
  - Availability of the models/software tools, level of maturity (user friendliness, especially for SMEs)
  - Costs: investments in person months and hardware, simulation time, model accuracy/predictability
  - Return of investment / benefit
  - Validation of the model: strategy for validation of each modelling flow is proposed, considering the initially available experimental data and generation of new data.
  
- 5) The Translator proposes to the client modelling executor(s) and strategy for model validation based on expertise, experience, availability and preference of the client (if any). Once the project has started, the Translator follows the project and represents the client interests during project execution.
  
- 6) Translation process finishes with translation of the modelling results to information that is understandable, reliable and usable by the client. A follow-up and evaluation of the process is desirable but not always required. Prediction of trends is sometimes sufficient.

### 2.3 Skills of the Translator role

- Industrial background:** knows and understands how industry operates, including the business decision process
- Academic background:** knows what and where is the academic / technical expertise
- Deep and broad **knowledge of modelling** and software tools, including the limitations and pitfalls of the tools and methods.
- Broad **understanding of different experimental techniques** and data analysis (need to know the criteria for evaluation of data quality)
- Softs skills:** communication (need to speak the academic and industrial language), convincing, listening, analysis, flexibly
- Knowledge of **economic impact:**
  - Translators need to have skills for evaluation/estimation of the investment vs. return. This is still lacking as a major Translator skill and the tools to make such evaluation are largely missing. It might be possible to give a qualitative estimation by considering the number of experiments that will be saved by modelling; having in mind that often experiments are more expensive than modelling. A more quantitative evaluation of the ROI could be done by the Translator after the modelling project is executed, with the help of the client. Courses/training of Translators on this topic are very desired/needed.
  - Translators need to have a toolbox (e.g. LCA tools, data repositories, statistical field data etc.) to be able to evaluate the applicability/accuracy/predictability of certain models and to compare (in qualitative or semi-quantitative way) different models:



this information should be provided by the model developers. For example, modellers are expected to provide model validation cases/procedures, accuracy (when possible to be evaluated), model specifics e.g. model maturity/developments. Models that are rather new should be acknowledged as such (higher risk models). More mature models are expected to have also more established validation/benchmarking procedures. If the Translator does not have this information in hand from the model developers, they do not have sufficient information to (safely) propose their models. Therefore model developers need to be encouraged/requested to provide as much as possible data for their models. An EMMC survey on this topic will follow soon. Difference is made between physics-based (predictive) models and data driven models.

- Translators need to receive from the software vendors relevant case studies. Such are often found in the software manual. The applicability of each software needs to be clearly indicated by the SWO. Often the possibilities of the software tools are known based on experience of the Translator on using these tools. Round-robin test by software users (and model developers) would be useful to give objective view on the capabilities of the different software tools. The Translator could ask several SWO to demonstrate the capability of their software in specific case and the client may choose the most suitable one. The Translator could also propose to the client to organise hackathons for competing software solutions on specific problem.
- **Neutrality:** the following aspects of this skill were accepted by all participants. A note to make is that the opinions varied a lot and the proposed below aspects of neutrality are giving only guidelines to how neutrality could be understood and considered, depending on the specific translation case. Individual notes are listed at the end of this paragraph.
  - The Translator is expected to give neutral advice and third parties might be involved in the implementation of the modelling workflow
  - The Translator should be free from hidden self-interests. They must place the interest of the clients before the interests of the Translator.
  - More than one solution should be proposed to the client to choose from.
  - A proposed solution for the industrial problem should not be biased towards the Translator's favourite models, methods or software tools.
  - The Translator may be part of the team providing a solution, if this is for the best interest of the client.
- Note 1:  
There should be some surveillance of the money flow and possibly a limit to how much of the project budget initiated through a Translator should go to his/her own organisation. This is to ensure that neutrality is preserved and that translation is distinguished from project acquisition.
- Note 2 (majority of the participants):  
Disagreement with Note 1. There should not be restrictions in budget flowing to the Translator own organisation. It should be even tolerated if people executing the



Translator role are also part of the modelling execution as this will facilitates/speed up the whole project.

- Personal note 3:  
If we are not able to find a new innovative ways for doing Translation, and fall back to the standard procedures implemented in our own institutes, we do not strive for innovative ways to bring modelling to industry by starting from and focusing on industrial challenges.
- Translators can be expected to show a proven **“track record”** of expertise on translation including success stories.
  - Note 1:  
Sharing success stories and translation projects could be restricted by confidentiality.
  - Note 2:  
Successful translation stories do not need necessarily to be also related to successful modelling cases. They should demonstrate the usefulness of the translation process itself, independent on the modelling execution process which may depend on many other factors not necessarily related to the translation process. Technical details (and names/topics) could be avoided if confidentiality is an issue. This “track record” of the translators can be used by the client and stored/published in the EMMC database of translators. The latter is useful for SMEs searching for translators to help them implement modelling.

It was discussed the need to bring the Translator’s work also to the domestic level. The SMEs often prefer to talk rather with a domestic Translator in their own language. Therefore it is important to build local Translators network in each country.

The participants of the meeting agreed that this report can be shared with the EMMC community and used for preparation of the Translators Guide.