Numerical Simulation in Product Development

Event Summary Report

NAFEMS

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Overview

NAFEMS - the International Association for the Engineering Modelling, Analysis and Simulation Community held its first Eastern European event in Budapest on Wednesday, 26th April 2017.

NAFEMS mission statement is "To promote the safe and reliable use of finite element and related technology". Since its inception in 1983, NAFEMS has become an independent, not-for-profit, international membership association, owned by its members. NAFEMS is the only worldwide independent association dedicated to FEA and CFD. Companies from numerous industries and every part of the globe have invested heavily in engineering technologies such as Finite Element Analysis and Computational Fluid Dynamics. We are an association of more than 1300 companies and academic institutions worldwide. Members range from major global corporations through mid-sized organizations to small-scale engineering consultants. As new application areas and techniques constantly evolve, NAFEMS becomes involved to create awareness and deliver appropriate education and training.

This free of charge, introductory event was held to find out which NAFEMS activities could help engineers working in numerical simulations in the Eastern European countries. It was also intended to find out if there is a need and enough support to form a NAFEMS Eastern Europe group.

The event brought together an impressive **65 industrial, academic and technology experts** from all disciplines of digital simulation. We had support from 5 renowned hardware and software vendors:–

- CAD-Terv Mernoki Kft.
- eCon Engineering GmbH
- Gamax Laboratory Solutions Ltd.
- GNS Systems GmbH
- S&T Consulting Hungary Kft.

The seminar served to bring together a wide spectrum of the leading visionaries, developers, and practitioners of CAE-related technologies, to share experiences, discuss relevant trends, discover common themes and explore future issues.

A Huge Thankyou ...

We would like to take this opportunity to sincerely thank Knorr-Bremse Rail Systems in Budapest and in particular Dr David Felhos, Department Leader for Technical Analysis and Simulations who not only hosted the event at their offices, but also David chaired the event and provided valued direction and ideas about what Eastern Europe may need and require from NAFEMS, for the first event in the region. Without their help, we would not have been able to deliver such a successful event.

Agenda

The day started with registration in Knorr-Bremse reception from 9:30am, we then started with a welcome and introduction from Dr Felhos and Tim Morris, NAFEMS Chief Executive Officer. The day was then filled with excellent presentations from industry and leading vendors:-

IT for Global Engineering. The European Knorr-Bremse CAE & HPC IT Infrastructure
C. Woll (GNS Systems)

Simulation Driven Innovation
H. Gruber (Altair Engineering / s&t Consulting Hungary)

Simulation Driven Product Development by ANSYS
L. Molnár (eCon Engineering)

Realistic Simulation
I. Nadj (CAD-Terv Group)

Analysis and Simulations in the Railway Industry: Practical Experience, Similarities and Differences Compared to the Automotive Industry
F. Günther (Knorr-Bremse, Munich, Germany)

How Small (but fine) Simulations can also Radically Improve Industrial Products
Z. Penzar (Continental, Frankfurt, Germany)

Quality Management in Engineering Simulation
D. Felhös (Knorr-Bremse, Budapest, Hungary)


...and how to reach it.
Healthy Organization Model
by: Imre Lövey & Manohar S. Nadkarni
Economical needs of the company
Needs of the customers
Needs of the employees
RAMP-UP GROWTH
IN HARMONY WITH THE ENVIRONMENT
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In the afternoon, a workshop took place with the audience split into four groups. Each group was asked to answer one of the questions below, discussing amongst themselves and then presenting their ideas and conclusions back to the audience as a whole. The workshop questions set were:-

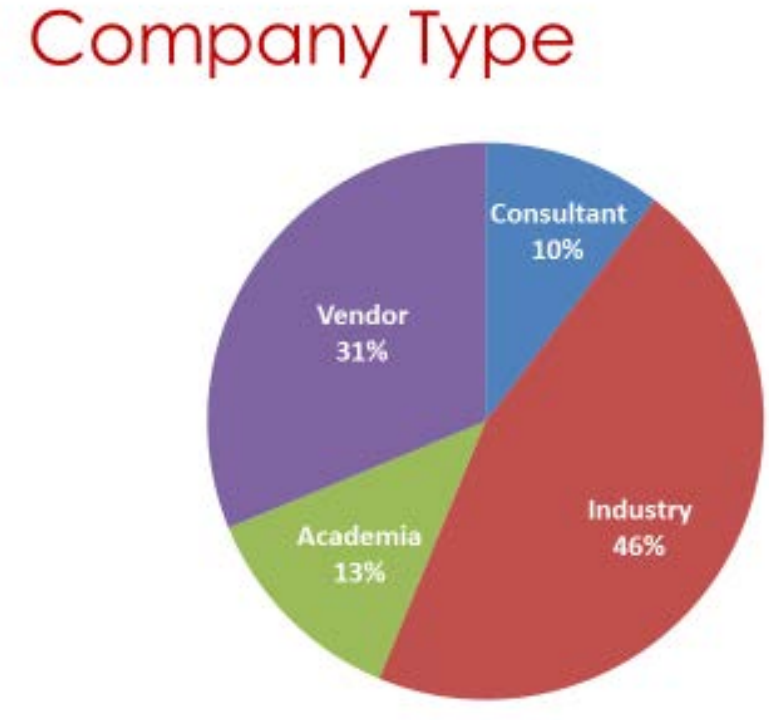
- How would you convince a sceptical manager about the benefits of the FE method? The manager would like to decrease costs and has no competency in technical matters.
- How would you encourage and motivate your colleagues to develop their simulation skills? What kind of possibilities (trainings, conferences, schools) would you offer them?
- Create a strategy to increase the reliability of your simulations.
- Draw an action plan to increase the trust in your organization among your customers and in the labour market, through the use of simulation.

As an outcome of the discussions, each team summarized their answers to the other teams, that way the attendees had the possibility to collect ideas from other professionals, which they could then use in the future.

The idea behind the interactive workshop, was to find out which NAFEMS activities could help engineers working in Eastern European countries.

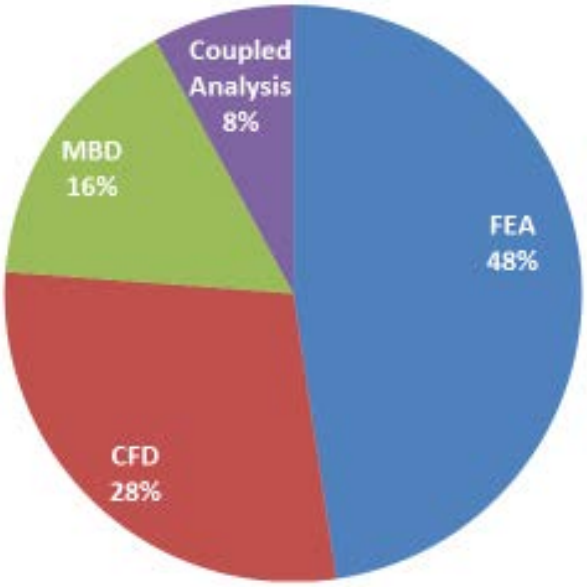
The second part of the afternoon focussed on the feedback questionnaire which had been provided to delegates when they arrived at Knorr-Bremse. This questionnaire was designed to gage whether there is sufficient support to move forward with further activities in the region and form a NAFEMS Eastern Europe group in the near future?

The results presented during the discussion session, are detailed below:-



This split is pretty much in line with the global NAFEMS membership

What simulations are you doing?



Again, this is similar to the percentages we see across NAFEMS Worldwide community.

What support would be beneficial?

- Large deformation
- Rubber material models
- Coupled thermo-structural problems
- Special details on FEA & CFD simulation
- Thermal fluid flow problems
- Geotechnics
- Material science
- Non-Linear analysis
- Dynamic analysis
- Pre-post processing automation
- Fatigue
- Modelling flow simulation
- Moulding
- Use of codes / standards
- Thermal simulation of PCB's
- Electronic system simulation
- Validation
- Interpretation of results
- Transient dynamics, fatigue durability approach

The above are issues we face across all established NAFEMS regions. We believe we will be able to assist with a lot of the subjects raised above, by way of awareness seminars and state-of-the-art workshops being held in the region. Along with events, we also have hundreds of introductory publications including overviews of these problems and detailed best practice guidelines.

The audience at the seminar decided that it was important that a NAFEMS group be set up in the region, in the future. This was extremely positive news and will help us direct activities in the future.

We are excited to see how the region develops and NAFEMS look forward to assisting all those involved with engineering simulation in Eastern Europe, going forward.

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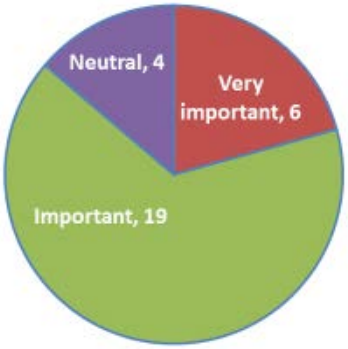
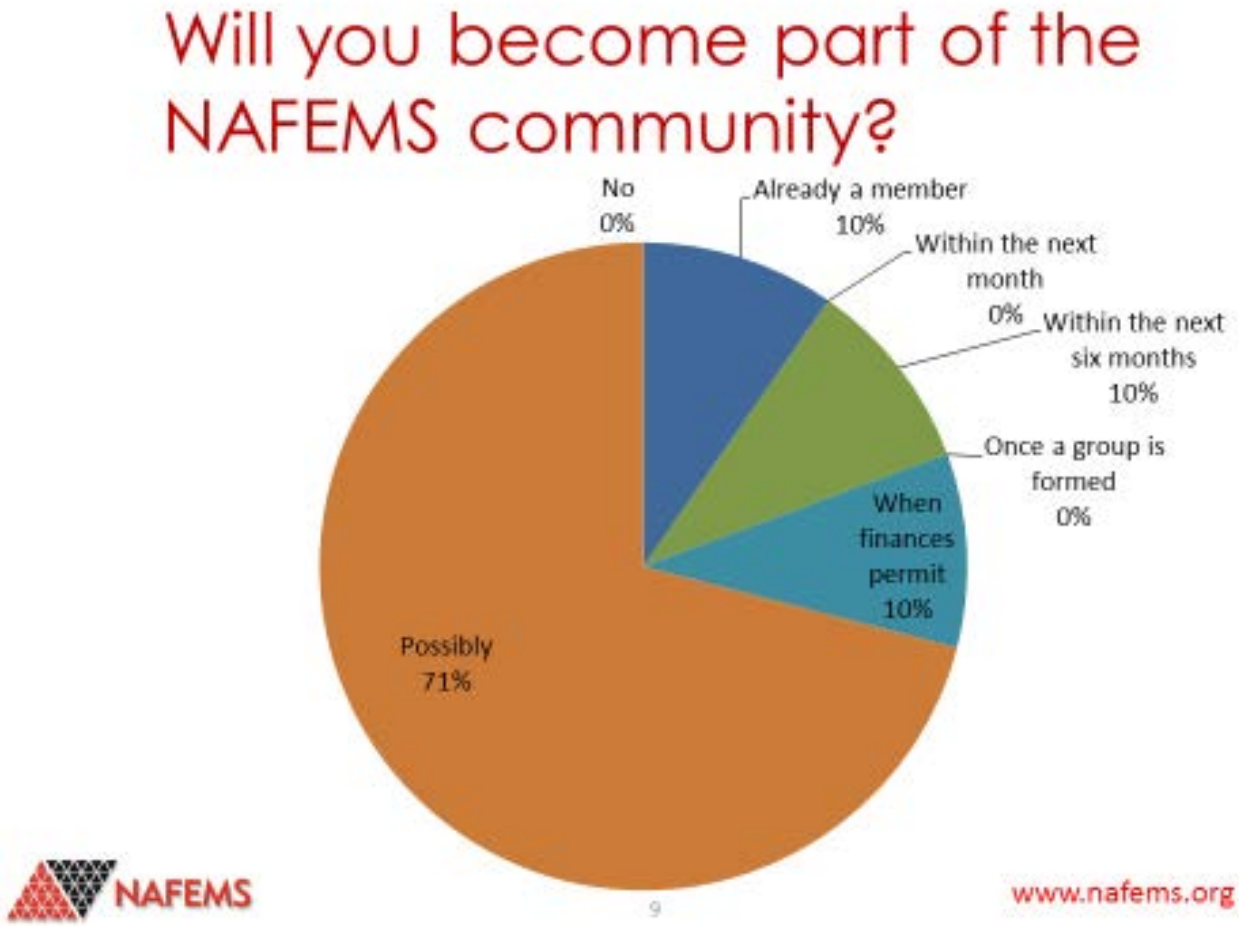
How important is a NAFEMS Eastern Europe Group?



In the next two questions from the feedback survey regarding countries that should be represented in a NAFEMS Eastern European region and also where would be most convenient for future events to be held, the consensus of opinion within the group was that Croatia, Czech Republic, Hungary, Poland, Romania, Serbia, Slovakia and Slovenia should be represented in any future NAFEMS Eastern Europe region, with over 15 votes for each of these countries. With regards to the next event, the most popular locations were clearly Bratislava (14%), Budapest (25%), Prague (15%) and Zagreb (11%). This gives us a very helpful guide when it comes to organising future activities.

The final question was key in addressing whether the community was willing and able to support NAFEMS with its future goals and activities in the region. Not a single representative said that they would not show their support with the majority expressing a strong desire to be part of the NAFEMS community in Eastern Europe.



The seminar concluded with a tour around the Knorr-Bremse plant which was found to be very interesting and a great end to an interesting and worthwhile first event in the Eastern European region.

Presentations from the seminar are available on the NAFEMS website at https://www.nafems.org/events/nafems/2017/eastern-europe/, if you require a reminder of the login details, please contact jo.davenport@nafems.org.