Model Management and Analytics - Final Report

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1. The Initiative - Vision and Goals

Model-based approaches promote the use of models, metamodels, model transformations etc. for building complex systems. With their increasing maturity and widespread use, their complexity, size, multiplicity and variety increase. The MOdel MAnagement And ANalytics (MoMA3N) initiative gathers modelling researchers and practitioners to discuss and solve emerging scalability problems. The scope ranges from industrial reports and empirical analyses to novel cross-disciplinary approaches for large-scale analytics and management, e.g. exploiting techniques from data analytics, repository mining and machine learning.

2. Activities

We kickstarted the project with several brainstorming meetings, which resulted in a joint position paper[1], presented at *Grand Challenges in Modelling* workshop at STAF '17 in Vienna, Austria, and very well received. Following that, we performed a series of activities, both national and international. Considering the pioneering nature of our initiative, these involved substantial networking, contributing a lot to the project's "community building" aspect. We set up modelanalytics.wordpress.com, to centrally announce and disseminate our activities and got a lot of attention worldwide.
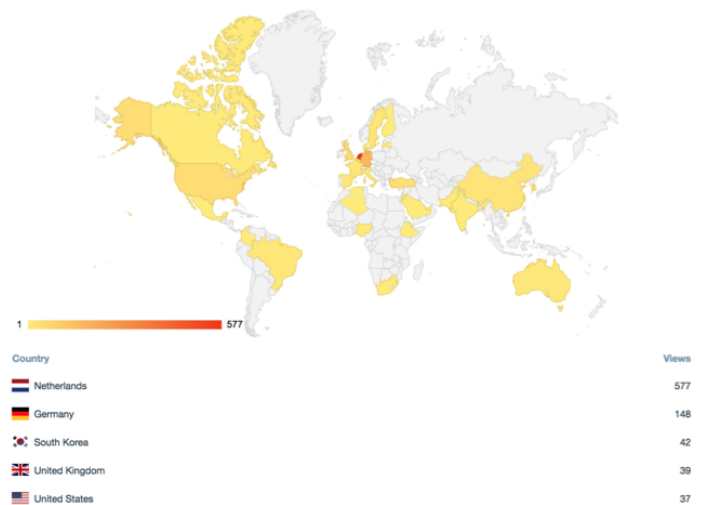

Figure: View statistics for MOMA3N portal

First Dutch Symposium on Model Analytics and Management

- Held at Wageningen University of Technology, 27 October 2017.
- 23 participants, 11 talks
    - Academic participants: TU/e, UT, WUR, Leiden, VU, Chalmers
    - Industrial participants: ASML, Altran, Oce, TNO, Philips, Thales, ICT
- Highlights
    - Cross-fertilization among software, hardware and business modelling experts
    - Much interest from the industry
    - A preliminary exploration of potential joint activities, funding applications, etc.

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[1] Babur Ö., Cleophas L., van den Brand M., Tekinerdogan B., Aksit M. (2018) Models, More Models, and Then a Lot More. In: Seidl M., Zschaler S. (eds) Software Technologies: Applications and Foundations. STAF 2017. Lecture Notes in Computer Science, vol 10748. Springer, Cham

First Dutch Symposium MOMA3N

First International Workshop on Model Analytics and Management

- Collocated with 6th International Conference on Model-Driven Engineering and Software Development, Madeira, Portugal, 23 January 2018.
- 5 paper presentations, 2 invited talks
- Highlights
  - International visibility
  - Two research papers published from our project at the conference[2]
  - Invitations to collaborate with teams working on EU projects on modelling
  - A great deal of enthusiasm by the community for a second workshop iteration

Book on Model Analytics and Management @ Elsevier

- Proposal accepted. Reviewers confirmed the high relevance and actuality of the topic, and the lack of such a book in the literature. To directly quote one of the reviews, our book will be "*the first comprehensive book*" on the topic.

Winter Modeling Meeting

- Mark van den Brand participated with 30 world-leading researchers in modeling. Model management was one of the two primary challenges worked on. A first metamodel to represent models in a multidisciplinary environment resulted from this meeting.

3. Final Remarks

Model analytics and management is an increasingly important and relevant topic for within various model-based approaches, but has remained under the radar. Overall, the 4TU.NIRICT community project project has been a great enabler and boost for us to build such a community almost from scratch, which certainly has significant potential to grow further across 4TU, in the Netherlands beyond 4TU, and internationally. We thank 4TU.NIRICT for the support, and hope to continue our efforts to advocate and advance this community.

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[2] Babur, Ö. (2018) Clone Detection for Ecore Metamodels Using N-grams, The 6th International Conference on Model-Driven Engineering and Software Development, to appear.

Babur, Ö., Cleophas, L., van den Brand, M. (2018) Towards Distributed Model Analytics with Apache Spark, The 6th International Conference on Model-Driven Engineering and Software Development, to appear.