

# A Classification of Collaborative Model-Driven Software Engineering Approaches: Opportunities and Challenges

Davide Di Ruscio and Mirco Franzago

Department of Information Engineering, Computer Science and Mathematics (DISIM)  
University of L'Aquila, Italy

{davide.diruscio | mirco.franzago}@univaq.it

## ABSTRACT

Collaborative software engineering (CoSE) deals with methods, processes and tools for enhancing collaboration, communication, and co-ordination (3C) among team members [3]. CoSE can be employed to conceive different kinds of artifacts during the development and evolution of software systems. For instance, when focusing on software design, multiple stakeholders with different expertise and responsibility collaborate on the system design.

Model-Driven Software Engineering (MDSE) provides suitable techniques and tools for specifying, manipulating, and analyzing modeling artifacts including metamodels, models, and transformations [1]. A collaborative MDSE approach can be defined as a method or technique allowing multiple stakeholders to work on a set of shared modeling artifacts, and to be aware of each others' work. Even though Collaborative MDSE is gaining a growing interest in both academia and practice, a holistic view on what Collaborative MDSE is, its components, the related opportunities and challenges is still missing.

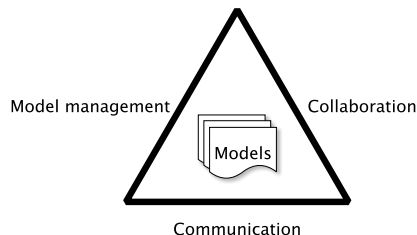


Figure 1: Collaborative MDSE dimensions

In this talk, we outline the main insights of the systematic mapping study [4] we have done to identify and classify approaches, methods, and techniques that support collaborative MDSE (for the complete protocol of the mapping, see [2]). We present three complementary dimensions that we have identified during the study as the peculiar aspects building up a collaborative MDSE (Figure 1): a *model management infrastructure* for managing the life cycle of the models, a set of *collaboration means* for allowing involved stakeholders to work on the modelling artifacts collaboratively, and a set of *communication means* for allowing involved stakeholders to be aware of the activities of the other stakeholders. The identification of limitations and challenges of currently available collaborative MDE approaches is also given by discussing the implications for future investigation.

## Biographies of the authors

**Davide Di Ruscio** is Assistant Professor at the Department of Information Engineering and Computer Science and Mathematics of the University of L'Aquila. His main research interests are related to several aspects of Model Driven Engineering (MDE) including domain specific modelling languages, model transformation, model differencing, model evolution, and coupled evolution. He has published more than 80 papers in various journals, conferences and workshops on such topics. He has been in the PC and involved in the organization of several workshops and conferences, and reviewer of many journals like IEEE Transactions on Software Engineering, Science of Computer Programming, Software and Systems Modeling, and Journal of Systems and Software.

**Mirco Franzago** is a PhD student in Information and Communication Technologies (Software Engineering and Intelligent Systems curriculum) at the Department of Information Engineering, Computer Science and Mathematics (DISIM) - University of L'Aquila, Italy. His research focuses on collaborative software engineering, model-driven engineering and mobile enabled systems, especially on how MDE techniques can be exploited to support stakeholders' collaboration during the design and development of complex and mobile-enabled software systems. He is program committee member and reviewer for international conferences and workshops in his fields of interest.

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