

# Summary of the 1st International Workshop on Hybrid Development Approaches in Software Systems Development

[Co-located with ICSSP 2017]

Marco Kuhrmann  
Clausthal University of Technology  
Goslar, Germany  
kuhrmann@acm.org

Jürgen Münch  
Reutlingen University  
Böblingen, Germany  
Juergen.Muench@Reutlingen-  
University.de

Paolo Tell  
IT University Copenhagen  
Copenhagen, Denmark  
pate@itu.dk

Philipp Diebold  
Fraunhofer IESE  
Kaiserslautern, Germany  
Philipp.Diebold@iese.fraunhofer.de

## ABSTRACT

The first international HELENA workshop was held co-located with the 2017 International Conference on Software and Systems Process (ICSSP). The goals of this workshop were to bring the HELENA team together, foster general networking, discuss the current state of the project, and develop a roadmap towards future activities. From the 84 researchers and practitioners from 25 active countries, 25 participated in this workshop. The overall status report shows that the HELENA survey is increasingly gaining attention, and more than 300 data points have been collected so far. The team agreed on a number of topics for future activities, e.g., organizational transformation, adaptation and evolution, and development approaches for safety-critical systems.

## Categories and Subject Descriptors

D.2.9 [Software Engineering Management]: Software process models

## Keywords

software process, process description, process improvement, agile methods, hybrid development approaches

## 1. INTRODUCTION

A software process is a game plan to organize project teams and projects. Yet, it still is a challenge to select the appropriate development approach for the respective context. Many development approaches compete for the users' favor, but there is no silver bullet serving all possible setups. Also, recent research as well as experience show companies utilizing different development approaches to assemble the best-fitting approach for the company: a more traditional process providing the basic framework to serve the organization, and a more agile or lean set of practices to retain flexibility at the project/team levels [7, 6, 1, 2].

In the closing session of ICSSP 2016, HELENA was introduced as a new community project [4]. HELENA is an exploratory multi-stage large international survey-based study on the use of “**H**ybrid **dE**velopment **L**opm**E**nt **A**pproaches in software systems development”. The study aims to investigate the current state of practice in software and system development. In particular, we aim to determine: (i) which development approaches (traditional, agile, mainstream, or home-grown) are used in practice, (ii) how they are combined, (iii) how such hybrid development approaches are de-

veloped over time, and (iv) if and how standards (e.g., safety standards) affect the development process and the methods applied. With this information, HELENA aims both at understanding the practical application of hybrid development approaches as well as at developing and deploying new systematic process designs and improvement activities to allow for more efficient and effective development approaches. HELENA comprises three stages:

1. The first stage was concerned with the development of the survey instrument and the initial data collection with a particular focus on Europe.
2. The second stage, currently ongoing, is focused on the actual data collection in the international network.
3. The third stage will focus on follow-up research on topics of interest as defined by the community.

The first stage was initiated in May 2016; and the stage-1 questionnaire was accepting answers from May to June 2016. Results from stage-1 were reported at ICSSP 2017 [3].

Just after the closing of the first stage, the second stage was initiated. In the course of setting up stage-2 of HELENA, the team was substantially grown. Currently, 84 researchers and practitioners from 25 countries contribute to HELENA. Based on the learning from stage-1, the stage-2 team revised the survey instrument, which was continuously tested until April 17, 2017. On May 2, 2017, the stage-2 questionnaire of HELENA was made available to the public. A second part of the HELENA endeavor is the team work. For this, from the very beginning on, several workshops were planned to bring the team together. The first workshop—which we report in the article at hand—was held in conjunction with the 2017-edition of the *International Conference on Software and Systems Process* (ICSSP).

## 2. WORKSHOP ORGANIZATION

This workshop was the first meeting of the team after the launch of stage-2 of HELENA. The goals of this first workshop were:

1. To report the current state and (tentative) outcomes of the HELENA survey (from a global and regional perspective).
2. To develop a work program and define the next steps within the entire community.
3. To build working groups, which will work on selected topics of interest.





**Figure 2: Outcome of the breakout session: topic collection and initial topic clusters.**

### 2.3 Further Discussion and Next Steps

Besides the discussion of future research directions and respective focus topics, the participants to the workshop agreed that some effort should be spent on providing a refined notion of concepts and terminology. In particular, in [3], we provided an initial definition of the term *hybrid development approach*. Yet, at the workshop, the question was raised of whether it could be necessary to improve this definition—notably in the light of the general difficulties to accurately shape the terminology in the process domain (see for instance the effort spent just on defining the term “agile” [5]). Eventually, it was decided to build a team headed by Özden Özcan-Top and Paolo Tell to develop a position paper in which the HELENA team clarifies the notion of the concepts researched.

The second point of interest was the data collection phase of stage-2; specifically, the issues coming along with the different availabilities of team and practitioners around the globe. The team agreed on extending the data collection until the end of September 2017 to provide all regions more space to contact their local partners and to spread the word on HELENA. Furthermore, we could welcome a new team from Portugal and initialized the formation of a USA team.

Complementing the data collection, use of the data was discussed. Among other aspects, the team decided to pursue joint publication strategies and to sharpen incentives to be offered to participating companies in return for their support.

Finally, the HELENA team started discussion and work towards an *EU COST Action Network* proposal. This joint application shall serve as umbrella to host the planned follow-up research activities. Results from the workshop shall be used as initial input for this proposal.

### 3. FUTURE ACTIVITIES OF HELENA

The HELENA workshop co-located with ICSSP 2017 was the first of a series of workshops. In the closing session, we presented the roadmap for the upcoming events. The second HELENA workshop will be hosted by the *International Conference on Product-Focused Software Process Improvement (PROFES) 2017*, November 29–December 1, 2017 in Innsbruck, Austria. This second



**Figure 3: The HELENA workshop participants in the welcome reception and networking session.**

workshop aims at presenting the initial findings from the second stage and continue the research collaboration. Furthermore, the third HELENA workshop is going to be held in conjunction with the *Evaluation and Assessment in Software Engineering Conference (EASE) 2018*, June 28–29, 2018 in Christchurch, New Zealand.

Detailed information on HELENA and all related team activities can be found online: <https://helenastudy.wordpress.com/>

### 4. ACKNOWLEDGMENTS

Our thanks goes to all participants of the first HELENA workshop (Fig. 3) that made this event, the lively discussions, and the work sessions possible. Furthermore, we thank the ICSSP 2017 organization team for having us. Eventually, we thank the whole HELENA team and all study participants that support us in this huge endeavor.

### 5. REFERENCES

- [1] M. Cusumano, A. MacCormack, C. F. Kemerer, and B. Crandall. Software development worldwide: The state of the practice. *IEEE Software*, 20(6):28–34, Nov 2003.
- [2] C. Jones. Variations in software development practices. *IEEE Software*, 20(6):22–27, Nov 2003.
- [3] M. Kuhrmann, P. Diebold, J. Münch, P. Tell, V. Garousi, M. Felderer, K. Trektore, F. McCaffery, O. Linssen, E. Hanser, and C. R. Prause. Hybrid Software and System Development in Practice: Waterfall, Scrum, and Beyond. In *Proceedings of International Conference on Software and Systems Process*, ICSSP, pages 30–39. ACM, 2017.
- [4] M. Kuhrmann, R. V. O’Connor, D. E. Perry, and D. Raffo. Summary of the International Conference on Software and System Processes (ICSSP 2016): [Co-located with ICSE 2016]. *SIGSOFT Softw. Eng. Notes*, 41(5):27–30, Nov. 2016.
- [5] M. Laanti, J. Similä, and P. Abrahamsson. *Definitions of Agile Software Development and Agility*, volume 364 of *Communications in Computer and Information Science*, pages 247–258. Springer-Verlag, Berlin, Heidelberg, 2013.
- [6] G. Theocharis, M. Kuhrmann, J. Münch, and P. Diebold. Is Water-Scrum-Fall Reality? On the Use of Agile and Traditional Development Practices. In *International Conference on Product Focused Software Development and Process Improvement*, volume 9459 of *Lecture Notes in Computer Science*, pages 149–166. Springer, Dec 2015.
- [7] L. R. Vijayarathy and C. W. Butler. Choice of Software Development Methodologies: Do Organizational, Project, and Team Characteristics Matter? *IEEE Software*, 33(5):86–94, Sept 2016.