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

[Co-located with ICSSP 2017]

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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 “Hybrid Development Approaches 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 developed 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 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.
Table 1: Schedule of the first HELENA workshop.

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>09:00–09:15</td>
<td>Opening, welcome and introduction</td>
</tr>
<tr>
<td>09:15–10:15</td>
<td>Reports from the global perspective and from the regions</td>
</tr>
<tr>
<td>10:15–10:30</td>
<td>Setup of working groups</td>
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<tr>
<td>11:00–12:30</td>
<td>Working groups breakout sessions</td>
</tr>
<tr>
<td>14:00–15:30</td>
<td>Working groups formation and consolidation</td>
</tr>
<tr>
<td>16:00–17:15</td>
<td>Presentation of working group outcomes and development of HELENA agenda</td>
</tr>
<tr>
<td>17:15–17:30</td>
<td>Closing</td>
</tr>
</tbody>
</table>

The workshop was organized by Marco Kuhrmann (Clausthal University of Technology, Germany), Paolo Tell (IT University Copenhagen, Denmark), Philipp Diebold (Fraunhofer IESE, Germany), and Jürgen Münch (Reutlingen University, Germany), and was held on July 5, 2017 in Paris. To address the goals above, the first workshop was organized as a series of working sessions and status reports. Table 1 shows the workshop's schedule.

2.1 Status Reports

The global status, we had one regional status report from Denmark by Paolo Tell. This report related the selected (global) data with the regional ones. Differently from the global dataset, participants from Denmark are mostly part of either very large companies or small ones, rather than large, medium, and micro-sized companies. Furthermore, the distributed work pattern in Denmark differs from the global one as participants report to be involved in global and regional collaboration rather than collaborations within national borders. As a data snapshot was created for the workshop, some discussion on details—also for other regions—complemented the general status reports.

2.2 Breakout Sessions and Working Groups

The second part of the workshop was fully devoted to work. Specifically, the breakout and working groups sessions aimed at developing a set of scoped topic areas in which the team plans to conduct further in-depth research. Therefore, this part of the workshop started with an Open Space in which topics of interest were collected and structured as illustrated in Fig. 2.

The six topic clusters shown in Fig. 2 were voted by all participants and three of them were chosen for a detailed elaboration in the working groups session. The three topics were Organizational Transformation, Adaptation and Evolution, and Safety were selected for discussion. Three groups were formed that discussed these topics in more detail with the goal to pitch the topics. The pitch aimed at delivering a better understanding of the topic as a whole, gaps in the stage-2 data collection for this particular topic and, consequently, required extra work for follow-up in-depth research. The results from the groups were presented by Özden Özcan-Top (Dundalk Institute of Technology, Ireland), Jürgen Münch, Regina Hebig (Chalmers and Gothenburg University, Sweden), and Peggy Gregory (University of Central Lancashire, United Kingdom).

2To prepare the workshop and accepting that not all team members will be able to attend the workshop, we conducted a small pre-workshop survey to collect ideas and extra topic proposals from the whole team. In total, this pre-workshop survey produced 37 responses and more than 30 topic proposals.
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 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 go 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