Report from the PhD Symposium at XP2013 – An Adaptive Experiment in Feedback

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ABSTRACT
In this paper, we describe the PhD Symposium organized as a part of the 14th International Conference on Agile Software Development (XP2013). The Symposium was run with an experimental adaptive structure and was divided into two workshops distributed across the conference as well as individual sessions during the conference. The activities of the second workshop were adapted based on the learning needs of the attendees. In this report we describe the structure of the two scheduled workshops, the activities conducted both during and between them, and evaluate the outcome of this Symposium format.

Keywords
Agile Research, Agile Software Development, Continuous Delivery, Process Innovation Drivers, Collaboration, Adaptive Workshop Design, Feedback

1. INTRODUCTION
The PhD symposium at XP2013 was designed to give the opportunity for PhD students to discuss their work, engage with colleagues and experts in the field of Agile Software Development (ASD) [1] and gain valuable feedback. The PhD symposium at XP2013 had three main goals:

- Provide an opportunity for PhD students to get feedback on their research and to gain insight into other students' research and current practice.
- Form a collaborative network across students, researchers and practitioners within the field.
- Provide feedback and guidance to doctoral students working on their dissertations.

The symposium had an experimental design with the aim of fulfilling these goals in a more interactive and network-oriented manner. By taking values, principles, practices and facilitation techniques from ASD approaches the symposium aimed to increase feedback and respond adaptively to attendees' learning needs.

2. PHD SYMPOSIUM STRUCTURE
The PhD Symposium at the XP conference has previously been organized as a one day workshop – outside the main conference – targeted at academics in the research area of ASD. For 2013 the structure of the PhD Symposium was revised and an experimental structure agreed with the conference organizing committee.

The goal of the revised structure was to explore whether a distributed and tailored workshop design would provide a greater learning opportunity for students through supporting increased interaction and feedback from practitioners as well as greater opportunities for reflection and tailored activities.

Three early-stage PhD students presented their research as part of the PhD Symposium, and attendance was open to all conference attendees. Presenters were accepted based on peer-reviews of submitted short papers summarizing their research. Two of the three PhD students were part time and also worked in industry, while the third was studying full time. Additional attendees included a late-stage PhD student and industry practitioners.

The symposium was divided into three parts: two workshops (one at the beginning and one at the end of the conference), as well as a working period during the conference itself. The structure and activities from the PhD Symposium are summarized in Table 1.

Table 1. XP2013 PhD Symposium Structure

Activities	Section
Workshop 1 (3 June 2013)	
Introductions & Background. Gather Research Challenges, Questions and Successes	3.1
Individual Presentations	3.2
Review of Small Goal Approaches	3.3
During Conference	
Individual discussion and provision of feedback from distance reviewers	3.4
Introduction to practitioners and researchers related to each attendee's research area, for additional feedback	3.4
Workshop 2 (7 June 2013)	
Identify approaches to evaluating the effectiveness of the PhD Symposium and Review	3.5, 4.1
Time Planning and Management Activity	3.6
Research Interview Skills Practice	3.7

3. PHD SYMPOSIUM ACTIVITIES
In the following sections we describe the activities from the PhD Symposium in more detail.

3.1 Workshop 1: Attendee Challenges and Successes
The first workshop commenced with a short round of introductions and an overview of the PhD Symposium structure.

Data about challenges, questions and successes were then gathered in order to be able to align participants, identify common concerns and highlights, and enable support for any specific issues. Each participant wrote down their current challenges, questions and successes onto Post-It notes. Results were then grouped and discussed.

The main challenges faced by attendees have been grouped into four categories. Italics indicate verbatim transcription:

1. Research Focus: *Too much data. Open research questions. Hard to know where to focus analysis.*
2. Data acquisition: *Getting data. Data acquisition.*

3. Motivation: *Keep going. Long timeframes of research work.*
4. Time: *Not enough time. Lack of time. Combining work with research.*

The main successes were also categorized into four groupings:

1. Data and ideas available: *A lot of data. Data from industry. Ideas (lots of them).*
2. Support and help available: *Plenty of help available. Support for research approach. Online support.*
3. Interestingness: *Interesting.*
4. Small steps and feedback: *Short term goals. Regular Feedback. Small successes – presentations, articles. One published workshop paper.*

The questions attendees had about PhD research were more scattered, but with fewer responses overall. The questions puzzling the participants included:

1. How do you start such a long-lasting project?
2. How do you perform research in an industrial setting?
3. Is it too late for my data? (Is my data recent and relevant?)
4. How do you measure qualitative data?
5. How do you keep the goal in sight?
6. How do you realize the benefits?

3.2 Workshop 1: Paper Presentations

Each participant presented their topic and research within a 15-minute timebox. A further 15 minutes was then used for feedback from industry practitioners and academic researchers, as well as for open discussion. The three presentations and research topics are summarized below.

3.2.1 Agile and Lean in Safety-Critical Software Development

Henrik Jonsson (Etteplan) gave a presentation of his research work on the practicability and effectiveness of Agile and Lean in safety-critical software development. This research work was motivated by the challenges faced by previous agile adoption attempts in projects that could be seen as a poor fit for ASD.

3.2.2 Agile Methods as Process Innovation Drivers

Tomi Juhola (University of Turku) presented his initial dissertation topic with main research questions revolving around process innovations realized due to usage of ASD methods; how these methods drive innovation and how could common innovation management practices be of benefit in an Agile software development context. Juhola was working on a systematic literature review on ASD and innovation, as well as a research design on quantitative study of ASD teams and their stakeholders' innovation capabilities.

3.2.3 A System Dynamics Modeling of the Continuous Delivery Process

Olumide Akerele (Leeds Metropolitan University) presented his research work aiming to develop a System Dynamics (SD) model to achieve a repetitive, risk-free and effortless Continuous Delivery process to reduce the risk of delayed delivery, delivery cost overrun and poor quality delivered software. Akerele's model will be validated by the results of a completed software development project adapting continuous delivery techniques during the lifecycle of the project.

3.3 Workshop 1: Review of Small Goal Approaches

For this activity students paired up to discuss a set of cue cards presenting a series of oblique thinking strategies [2][3] for breaking down large problems.

As PhD research is a large project commitment it can be argued to suffer from similar failure causes as any software development project. This activity was designed to reinforce the recognized success of breaking work down into small achievable steps and getting regular

feedback, as identified in 3.1. Using small goal approaches can help sustain pace and motivation through enabling smaller achievements on a more frequent basis.

By exploring these strategies as a part of the workshop students were able to find approaches that would be particularly suitable for their contexts and approaches to working and identify potential pitfalls.

3.4 Activities during the Conference

The PhD Symposium short papers were sent to selected practitioners and researchers for review before the conference. One-on-one meetings were then scheduled to provide individual feedback on the topic and for tailored discussion. Participants were introduced to reviewers and to at least two other discussants from industry with an interest in their topic. Additional support was given by the symposium organizers as requested.

The activities conducted individually during the conference were perceived as very valuable by participants. The one-on-one meetings with both academics and practitioners provided lots of feedback for the attendees. This feedback created more options, validated the relevance of the topics and helped in exploring the next steps for the research. During the discussion participants could also question their own methodology and objectives, and develop further insights.

As XP2013 also organized an Open Space [4] event as part of the conference, this provided an additional valuable venue for the participants to run sessions of their own to validate their research and to find out what topics are seen as valuable by the practitioners. The social aspect of the open space was also seen as a benefit.

The organized meetings, open space and ad-hoc networking during the conference were particularly valued by the attendee who was closest to finishing his dissertation. The conference provided many ideas to pursue after PhD completion.

3.5 Workshop 2: Evaluating the PhD Symposium

The first activity of the second workshop was designed to encourage students and attendees to reflect on different approaches that could be used for evaluating the same phenomena depending on context.

Participants were asked to provide ideas for what approaches they might take to evaluate the PhD Symposium itself. They were presented with three contexts and asked what activities or approach they might take for each. The three contexts presented to them were:

1. The case where the PhD Symposium is considered a course or educational session.
2. The case where they were researching PhD Symposia as a research topic.
3. The case where, as part of a collaborative project, a retrospective [5] is planned.

Output from this activity is summarized in Table 2. Italicized text indicates verbatim transcription.

Table 2. Reviewing PhD Symposium

Educational Session or Class	Research	Retrospective
• *Feedback Form* • *Longer one-on-one session* • *Exam / measurement / targets* • *Better awareness (maybe)*	• *Gather data (Interviews / surveys / observations / analysis on static stuff)* • *Open Questioning* • *Literature Review* • *Model it*	• *Timelines and team discussion* • *Proactive request of feedback preference* • *Constant surveys* • *Come up with improvements together*

Workshop attendees then gathered data as if they were evaluating the workshop through a retrospective approach. Output from the retrospective activity is summarized in Table 3 and provides gathered data and collaboratively identified improvement suggestions.

3.6 Workshop 2: Time Planning Exercise

This activity was incorporated into the workshop based on the output from 3.1 where two of the top challenges were motivation and time planning. This was an adaptive exercise, which was planned and added to the workshop after feedback from the activities and output of the first workshop.

For this activity attendees first discussed the importance of time planning for managing their research. This particularly focused on sustainable pace and allowing time for activities. Motivation, focus and scope were seen as key, as were awareness of long term and short term goals.

Based on a discussion of attendee experiences it was agreed that traditional project planning can be applied to a research project, especially to mark achievements and conduct linear planning, but, like many projects, this can be hard to maintain when faced with change. In addition, estimation at the task level was identified as difficult, especially for part-time students who have greater external demands on their time. The overhead of such an approach can be hard to sustain.

Drawing from an understanding that long term goals may change and an awareness of ASD planning techniques, a backlog view of planning was proposed. Students using this approach to time management would maintain a planning horizon with regular review meetings and would sequence tasks and group into timeboxes as an alternative to using time-based estimation and fixed deadlines. It was agreed that a one month detailed view with a longer term target could work well, but a target would have to be defined in the first place.

As a follow-on exercise students planned their respective activities onto a timeline: activities for the fortnight before the conference, activities for the week during the conference, activities for the week, fortnight, and month after the conference. Participants then reflected on the specific value each activity provided and annotated this onto the respective part of the shared timeline. It was agreed that, if conducted as a regular iterative planning activity, such an approach may be sustainable for PhD planning while also supporting student motivation.

3.7 Workshop 2: Research Interview Skills Practice

The final exercise in the second workshop was related to interview skills. All attendees agreed that knowledge and practice around interviewing- as an approach to data-gathering- would be of practical value; so an activity that practiced this skill was incorporated into the workshop. This exercise also supported the challenge of data acquisition defined in 3.1. As with 3.6 this exercise was adaptively designed and added to the second workshop subsequent to feedback and information provided during the first workshop and during the conference.

Continuing the theme of evaluating the learning experience of the PhD Symposium itself from 3.5, each attendee devised a series of questions they might ask in a research interview. In order to maximize the benefit of the exercise a dojo [6][7] format was applied.

The roles of interviewer, interviewee and observer were assigned for each participant – forming a group of three with one person in each role. The interviewer had 10 minutes to conduct their interview of the interviewee, while the observer 'observed.' After the interview, the observer would provide feedback and observations. The interviewer and interviewee would then reflect on their experience and impressions.

After this the roles were rotated and another interview round was held. This activity was repeated until each participant had played each role.

Table 3. Retrospective Output

Liked

- *Introduction to industry experts for discussion*
- *Feedback relayed*
- *Preference sought on feedback method*
- *Amount of feedback*
- *Diversity of feedback*
- *Using agile 'tools' to research*
- *Close collaboration*
- *One week learning process*
- *Good kick off for the week*

Lacked

- *Up front marketing*
- *Research from my area*
- *More participants*
- *Early feedback*
- *No publication*
- *Various perspective view on feedback / questioning (presentation)*
- *Lengthier proposal submitted to reviewer for feedback*
- *Top researchers present*

Learned

- *First empirical study design might be flawed, or needs also to be proven correct*
- *Opened up many options*
- *More about grounded theory*
- *Practitioners prefer "quick n dirty" or "cheap & cheerful" data gathering*
- *Need to lay good research foundation*
- *More realistic questioning of assumptions made*
- *Need for better objectives* (or clarity of objectives!)
- *How broad the topic is/could be if not focused*

Concrete Ideas and Suggestions

- *Keep PhD symposium distributed over conference – ideally over 3–4 days not 5*
- *More practical exercises on techniques e.g. interviews/presentation skills*
- *Keep a learning diary through the conference*
- *Video'd presentations*
- *Additional get together session during conference*
- *Reserve a PhD lightning talk session and/or poster session and/or Pecha Kucha and/or 1 slide/30 sec during main conference*
- *More researchers from outside Agile space*
- *Abstracts in conference programme*
- *Market that you will receive feedback from top names*
- *Two phase submission – expand paper in second phase for possible publication*
- *Getting more audience into the symposium*
- *Consider making the research ideas available to the rest of the conference – e.g. poster session*
- *More people to get feedback from, maybe some rapid format*

Examples of interview questions used included: '*What were your learning objectives when coming to the conference?*' '*Did they change along the way?*' and '*How well did you reach them?*' While participants had written interview questions in advance of their turn as

interviewer, they frequently adjusted their questions and approach having observed previous rounds of review.

This exercise had a three-fold advantage, it allowed attendees to:

1. Reflect on their experiences and learning from the conference.
2. Practice observation and giving/receiving feedback.
3. Develop interview skills through learning-by-doing.

For example, a particular instance of the latter was observed during one round where the acting interviewer was unconsciously cutting the interviewees responses short with his own interjections – which could be offensive to an interviewee in real-life. He accepted the feedback from the observer graciously!

4. DISCUSSION

4.1 General Feedback from Attendees
Feedback from attendees through evaluation forms indicated that overall the PhD Symposium had been well received: "*Got more than expected*" and "*Very valuable for new researchers!*"

Table 3 also provides the raw output (italics indicate verbatim transcription) from the evaluation or retrospective activity conducted in 3.5. The categories of 'liked,' 'lacked' and 'learned' were adapted from the '4 L's Retrospective' [8].

4.2 Reflection

4.2.1 Reflection from Organizer (Johanna Hunt)
"My goal was to experiment using ASD facilitation techniques applied to a PhD Symposium context with a view to increasing feedback to students from both practitioners and academics. While this approach had a greater overhead in terms of managing the experience for each attendee throughout the conference, as well as tailoring activities within the workshops based on attendee needs, I am very satisfied that it provided a positive learning experience to those that attended. I am also very happy to have so many concrete suggestions for future adaptation and improvement.

As an experiment in adaptive workshop design – tailoring the activities for the second workshop based on feedback and data gathered during the first workshop and conference – it validated that this has the potential to be a valuable approach to meeting the individual learning needs of PhD researchers."

4.2.2 Reflection from Presenter (Olumide Akerele)
"My major expectation before the conference was to engage with experts in the field and discuss the viability of my research work and to get feedback on the applicability of my model in the industry. My research approach was evaluated and the feedback I got exposed some basic assumption flaws in my model which needed proper clarification. Interaction with the industry experts to discuss the feasibility of my model in the industry was also very crucial, with even more support promised when my model is due for validation."

4.2.3 Reflection from Presenter (Tomi Juhola)
"My main expectation before the conference was to get basic feedback on the dissertation topic. I was expecting to validate that the topic is indeed interesting, and seen as valuable contribution. I did not have high hopes on getting very concrete ideas on what kind of research design would be suitable. My expectations were actually already fulfilled on the first day, and the one-on-one talks with practitioners and established researchers exceeded my expectations greatly. By the end of the conference I had many pages of notes, a big bunch of additional material to go through, and a few very concrete ideas to move forward with."

5. CONCLUSION
The PhD symposium was designed to span the full five days of the XP2013 conference, with the aim of engaging the ASD community to provide constructive feedback to the PhD students and to provide an engaging and adaptive learning experience closely tied to the conference.

Three PhD students successfully presented their work and gained substantial feedback, through a variety of routes, which should help them to improve their research work and focus. As the PhD symposium was experimentally designed, suggestions and ideas were also collected from participants to evaluate the success of this extended and adaptive approach, and present possible improvement activities in the future.

6. ACKNOWLEDGMENTS

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