Reflections on the third SoDIS SEPIA symposium

Tony Clear
Auckland University of Technology, New Zealand
tony.clear@aut.ac.nz

Dr Donald Gotterbarn
Auckland University of Technology, New Zealand
donald.gotterbarn@aut.ac.nz


Abstract

This paper briefly reports the authors' reflections upon the third SoDIS SEPIA symposium held in Auckland on 5 December 2003. This event represented the third bi-annual meeting of members of the Software Engineering Practice Improvement Alliance (SEPIA), a research collaboration between New Zealand, US and Australian researchers, educators and practitioners involved in developing and promulgating the concept of Software Development Impact Statements.

Keywords

Software development impact statements, risk assessment, collaborative research, software engineering education, software engineering research, software engineering practice

1. Introduction

The first SoDIS SEPIA symposium was held in November 2002 in Auckland, on KPMG premises, beginning a collaborative programme of research into the concept of software development impact statements [SoDIS] (Gotterbarn, 2001). In this initial symposium the focus was on the use of the SoDIS process, and the prototype CASE tool the SoDIS Project Auditor in educational settings, in order to refine and further develop the process and supporting tool. The further use of the process in commercial settings was to be advanced by joining with collaborating partners to apply it in software development projects, and refine or tailor the process as necessary through these field trials. This connection had been fostered through a breakfast meeting the day before jointly sponsored by Eagle technology, Auckland University of Technology (AUT) and the New Zealand Computer Society, in which Professor Gotterbarn had spoken to a group of IT professionals outlining the SoDIS process and its potential for improving software development and risk assessment processes.

The second symposium took place in Palmerston North prior to the NACCQ conference and involved educators from New Zealand and Australia, students and the developer of a commercial version of the SoDIS CASE tool.

The third symposium reviewed below, took place in Auckland on 5 December 2003 with a growing team and wider range of projects, and provides an opportunity to reflect upon the achievements in this research programme to date, and upon some of the challenges facing those engaged in practice improvement research in software engineering.

2. Improving the State of the Art in Software Engineering
The purpose of the SEPIA programme, can be summed up in the two statements below:

1. to improve the quality of the software development process and thereby the quality of software delivered across a wide variety of industries and domains.
2. to lift the current "state of the art" in software development, through developing, refining and promulgating the practice of applying better and more comprehensive project impact assessments.

This purpose in turn is being affected through a programme of action research. An action research programme typically progresses through cycles of action and learning. Susman and Evered (1978) in the diagram below outline a five phase process for each action cycle: beginning with a phase of problem diagnosis; progressing to planning and taking action; followed by evaluating the results and specifying the learning from the cycle just completed.

![Diagram of the Action Research Cycle](adapted from Susman & Evered, 1978, p. 558)

In this programme the bi-annual symposia offer a natural planning window for an action cycle within the research programme. They provide an opportunity for reflection to take stock of the progress made and learning gained in the previous cycle and are a natural planning point for the subsequent cycle, with an action plan from the symposium being a key deliverable from the event.

3. Reviewing Progress to Date

Reifer (2003) suggests eight critical success factors to be used as action guidelines when considering how to transfer recent developments in software engineering research into active use in the practice sphere. The SEPIA research programme is reviewed below against Reifer's eight action guidelines for using "state of the art" theory in software engineering practice.

Table 1: Review of SoDIS SEPIA Research Programme
Given the practice improvement and action oriented nature of the SEPIA research programme, Reifer's guidelines provide a useful framework to review progress to date.

4. Summary

As the table above indicates, there is much work yet to be done, but the degree of progress since the initiation of this collaborative research programme has been gratifying. Professor Gotterbarn's sabbatical from 2003 - 2004 supported by AUT, enabling his active leadership and engagement with the research programme has been critical to this effort. He has been active in visiting and speaking at several educational and professional venues throughout the country, and gathering new members for the initiative. Limited amounts of grant funding (see acknowledgements below) have helped get participants from several regions of New Zealand, Australia and the US to the symposia. KPMG have generously hosted two symposia on their premises, and Eagle Technology have also hosted a New Zealand Computer Society breakfast.

The list of participant institutions in the programme is growing, with New Zealand, Australian and US higher education institutions involved, and a growing number of commercial partners involved in field trials of the process. Undergraduate and postgraduate research assistants from AUT have also been working with external parties to help develop the process, and have participated in the most recent symposium. Momentum is certainly growing.

5. Challenges

The developments highlighted above indicate progress on a wide front, yet we have

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<th>Guideline</th>
<th>Status of Research Programme</th>
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<td>The technology is considered mature that it has been proven feasible for a range of applicable domains on a number of pilot and Pathfinder projects.</td>
<td>The SEPIA process has been used in selected commercial projects to significant effect (UK online education, KMC &amp; Co, Data warehousing application, and others).</td>
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<td>The body of knowledge (that is, the lessons learned by early adopters and associated process) related to the technology has been codified and is available in actionable form.</td>
<td>SEPIA partnering educational institutions have been tailoring the process for online, software engineering, project management, ethics, multimedia and systems analysis and design courses.</td>
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<td>Hard data associated with using the technology (performance benchmarks, productivity metrics, cost/benefit guidelines, defect rates, and so on) and an initial semiconcretized body of knowledge have been developed.</td>
<td>KPMG NZ have agreed to trial the process in New Zealand and Australia.</td>
</tr>
<tr>
<td>The rules associated with using the technology are documented, and guidelines for use are published.</td>
<td>SEPIA partnering educational institutions have been tailoring the process for online, software engineering, project management, ethics, multimedia and systems analysis and design courses.</td>
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<td>Industry-standard tools for either use with or for automating the technology have been developed and are readily available on the open marketplace.</td>
<td>Some findings have been published and the research programme is investigating appropriate metrics demonstrating the contribution from use of the SEPIA process.</td>
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<td>Training and support for introducing the technology have been developed and are available for use.</td>
<td>Simon Rogerson has developed a course in professionalism, including the SEPIA process which is now being offered at De Montfort University, UK.</td>
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<td>People other than the technology's developers are promoting its use for business as well as for good technical reasons.</td>
<td>Data from early projects has been shared at symposia.</td>
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<td>People other than the technology's developers are promoting its use for business as well as for good technical reasons.</td>
<td>Guides are under development to capture the process, with modifications to a SEPIA inspection process currently being developed and tested with EIT and Hogwarts processes.</td>
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<td>The organization planning to use the technology has prepared both technically and socially for the changes needed to take full advantage of it (most of the barriers to change are psychological, political and societal, not technical).</td>
<td>Experience with the SEPIA programme has shown the importance of gaining buy-in at all levels of the adopting organizations.</td>
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<td>Experience with the SEPIA programme has shown the importance of gaining buy-in at all levels of the adopting organizations.</td>
<td>A SEPIA consultants guide reviewing and refining the inspection process and action planning process are elements of the change and adoption strategies being employed.</td>
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<td>Research into lighter versions of the SEPIA process is being carried out, with the notion of a &quot;SEPIA inspection&quot; under development.</td>
<td>Experience has shown that one key contribution of a &quot;SEPIA inspection&quot; is that it requires the development of a contract for the process, thus broadening the scope of consideration.</td>
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<td>In educational settings, different partners are using approaches to use of the SEPIA process and CASE tool in teaching different subjects (Gotterbarn &amp; Sloot, 2004).</td>
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been surprised at the issues confronted both in this type of research and in this form of research programme. That something so apparently straightforward would prove so challenging, was not consistent with our initial expectations.

The constant need for active project management has proven a little surprising. However, the programme has many concurrent threads to maintain, and keeping all the participants active and focused has required consistent coordination, encouragement and support.

Disseminating the SoDIS Project Auditor CASE Tool, and resolving errors identified in field work, has been an exercise in global software engineering, requiring Professor Gotterbarn to coordinate virtual development teams in the US, and more recently to bring the work to AUT to enable tighter control of activities.

Initiating field trials with industry partners has been a stop-start process, with local panics on the client site often disrupting planned events. This can be problematic when teams of student research assistants are gearing up to support projects at the commercial partner's sites. Having back-up activities and plans has been useful to ensure the best use of available expertise.

These field trials (even those which have stalled) have brought significant insights into the SoDIS process, identifying some missing steps in its initial stages. The field work has informed the process redesign, with work now underway on defining the concept of a "SoDIS Inspection". In this form of practice improvement research the interactions between theory development, action and reflection appear quite tightly coupled and become self-reinforcing with successive cycles.

The educational trials conducted in several course and institutional contexts have also informed the SoDIS process redefinition, with the need for a lighter version of the process being apparent, both to match the limited time available for students in relatively full course curricula and to reduce the learning curve for them in coming up to speed with the process. Similar issues arise in commercial contexts especially the smaller sites, where barriers need to be broken down for any project related work deemed "non-essential" (such as risk assessment for instance), so that more professional practices can be adopted.

The partnering process has also led to opportunities to work on funding the research through new avenues such as through the international IT auditing body (ISACA), or the National Science Foundation in the US with the US collaborators taking the lead.

Volatility in the programme with its many tentacles is also fun, for instance Lesley Smith from Otago Polytechnic missed the symposium because she was in a London hospital talking about the SoDIS process with doctors involved in medical systems. Recently, a request was received from Dr. Gotterbarn's Polish colleagues asking for a translation of the SoDIS software into Russian and Polish. Now how do we resource and fund this opportunity, and from which country?

If nothing else this research programme to date has provided a fascinating window into the world of global software engineering.

Acknowledgements

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References


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