APPRECIATIVE INQUIRY IN SOFTWARE PROCESS IMPROVEMENT

Holmberg, Lena, Apprino, lena.holmberg@apprino.com
Nilsson, Agneta, IT University of Göteborg, agneta.nilsson@ituniv.se
Olsson Holmström, Helena, IT University of Göteborg and Lero – The Irish Software Engineering Research Centre, Ireland, helena.holmstrom.olsson@ituniv.se
Sandberg, Börjesson, Anna, Ericsson AB and IT University of Göteborg, anna.sandberg@ericsson.com

Abstract

Traditionally, SPI has been approached from a problem-oriented perspective commonly using models such as the IDEAL and the DMAIC. In contrast, appreciative inquiry is a strength-based approach focusing on bringing forward the best in people and organizations to achieve successful change. While there is significant research on SPI initiatives and the use of problem-oriented approaches there is limited knowledge about the way in which SPI initiatives unfolds when adopting a strength-based approach. Therefore, it is interesting to explore how software organizations familiar with problem-solving approaches experience the use of a strength-based approach. We present an action research study conducted at the Swedish telecom company Ericsson using appreciative inquiry to facilitate an SPI initiative implementing a new process and tool for requirements and test case management. While the SPI initiative was considered successful, important lessons were learned regarding the use of appreciative inquiry. We conclude that the use of appreciative inquiry does not eliminate the dependence on other well known key factors for SPI success. Also, our study indicates that the problem-solving mind-set, i.e. the satisfaction of identifying and solving problems, found among many software engineers familiar with problem-oriented approaches may impede the use of appreciative inquiry.

Keywords: appreciative inquiry, software process improvement, action research

1 All authors have made an equal contribution to the paper and are listed in alphabetic order.
1 INTRODUCTION

It is widely recognized that the process of managing organizational change is a challenging task. More than ever, organizations are struggling to improve the quality of their work processes as a strategy to stay competitive [1]. Especially, software process improvement (SPI) initiatives are complex [2-5]. While software is increasingly becoming an integral part of most products and services, many software development organizations have failed to realize their full business potential [6]. Traditionally, SPI initiatives have been approached from a problem-oriented perspective, which focuses on diagnosing and solving organizational problems. Typical examples of problem-oriented SPI approaches are the IDEAL model [7], and DMAIC [8, 9]. These approaches provide an organization with guidelines to facilitate software process improvement and activities to consider when organizing effective SPI work. While there are empirical findings indicating that these approaches have been effective in helping organizations improve the management of software and systems development work [10], there are a number of studies arguing the opposite [e.g. 6, 11, 12]. As argued in these studies, a large number of organizations have not succeeded in deriving competitive advantage with the application of such problem-oriented models. Most often, the reason for this is the inability of the organizations to introduce, deploy and institute the software engineering and management practices that these approaches recommend [6]. As recognized by Paulk [13], one reason for this might be that many approaches specify ‘what’ to improve but not ‘how’ to implement the practices described. Furthermore, problems arise due to insufficient organizational change management [14]. Often, this lead to a situation in which organizations focus on the software processes alone – ignoring the people processes that are critical for the behavioural transition needed for successful software process improvement [6].

Recently, an interest in the appreciative inquiry approach within information systems research has emerged as an alternative approach to organizational change. With its constructionist and including focus, it is in stark contrast to the problem-oriented approaches characterising the SPI paradigm. Instead of focusing on problems, appreciative inquiry is a strength-based approach focusing on how to bring out the best in people and their work practices. Whereas SPI initiatives and the use of problem-oriented approaches have been extensively studied, our knowledge about the ways SPI unfolds when using alternative approaches such as appreciative inquiry is limited.

This paper reports from an action research study concerning the use of appreciative inquiry in an SPI initiative at the Swedish telecom company Ericsson. In our study, we explore a specific SPI initiative and how it unfolds using appreciative inquiry instead of the more commonly employed problem-oriented approaches. More specifically, our research questions are:

- How does the use of appreciative inquiry influence known key factors for success in an SPI initiative?
- How does the use of appreciative inquiry impact individuals familiar with problem-oriented approaches?

In what follows, we introduce the IDEAL model as an example of commonly adopted problem-oriented approaches to SPI. In contrast to this model, the appreciative inquiry approach is presented and we compare the two and consider key factors for SPI failure and success. Section three describes the research method deployed in this study and the
characteristics of the research site. Section four presents our empirical findings using the social process model [15] as the organizing principle. Section five discusses the empirical findings and we conclude the paper by discussing implications of our findings and future research directions.

2 THEORETICAL CONTEXT

Organizations face the challenge of improving the quality of their work processes as a strategy to remain competitive. As a result, many companies struggle to reengineer, automate and improve the way they perform their business. In the software development area, this movement is visible in the growing number of studies concerning SPI initiatives. Below, we outline SPI research by introducing the IDEAL model. We let this model represent the problem-oriented focus typically found in SPI initiatives. Also, we introduce appreciative inquiry and the characteristics found in this approach. With its focus on strengths rather than problems, this approach is in stark contrast to traditional SPI approaches and we conclude the section with a comparison of the two.

2.1 Software Process Improvement

The term ‘software process improvement’ denotes the changes implemented in a software process that bring about improvements [16]. A software process can be defined as a set of activities, methods, practices and transformations that people use to develop and maintain software and the associated products, e.g. project plans, design documents, code, test cases and user manuals [17]. Generally, the intent of SPI work is to improve software product quality, to increase productivity and to reduce cycle time for product development. Today, SPI is dominated by problem-oriented approaches like the IDEAL model [7] and the DMAIC model [8, 9]. In this study, we let the IDEAL model represent a typical problem-oriented approach. The IDEAL model consists of five phases (initiating, diagnosing, establishing, acting, and learning) and provides software organizations with knowledge about how to organize SPI work. The model is cyclical and it creates opportunities to improve in a stepwise fashion. While highlighting both problems and possibilities, a majority of the tasks aim at identifying and solving problems. For example, the purpose of the task ‘develop solutions’ within the acting phase is “…to create solutions to the problems or processes that the organization has determined are necessary to meet the business needs of the organization” [7, p.103]. In similar fashion, Mathiassen et al. [18] have identified five core SPI principles. The first principle is ‘focus on problems’. They argue that problem solving is the essence of software process improvement, a view that can also be found in Grady [4], who pays attention to solving problems as a means for successful SPI. Finally, Humphrey [5], known as the “father of SPI”, claims that SPI is a complex task and to succeed in this he presents a list of nine bullets where the number one bullet is ‘identify key problems’.

As can be seen, most SPI literature focuses on problems and how to identify and solve these. Well-known approaches, including the IDEAL model as presented above, originate in a problem-solving mind-set commonly adopted in software development organizations today.

However, there are studies arguing that problem-solving approaches are not effective in helping software organizations improve their work practices. Reviewing several studies on organizational change, Moitra recognizes that the principal reason for this is the inability of the organizations to introduce, deploy and institutionalize the software engineering and
management practices that these approaches recommend [6]. One reason for this might be that many approaches specify ‘what’ to improve but not ‘how’ to implement the practices described [13], leading to a situation in which an organization identify problems, but is unable to deal with them in a constructive way. Furthermore, problems may arise due to insufficient organizational change management that might lead to an Underestimation of the efforts needed to accomplish the change process [14]. As recognized by Humphrey [5], SPI is not simple and to achieve tangible results it should be treated like a development task. A development task is normally treated with full attention in areas such as staffing, planning, process use, and progress follow-up. Further, there are authors arguing that a profound knowledge of the enablers and inhibitors of software process improvement is still lacking [19]. This may lead to a situation in which many organizations focus on the software processes alone while ignoring the people processes that are critical for the behavioural transition needed for successful software process improvement [6]. As can be seen, there are several studies recognizing shortcomings in the problem-oriented SPI approaches. To address these, we explore the use of appreciative inquiry, i.e. an alternative approach focusing on strengths and constructive thinking instead.

2.2 Appreciative inquiry

Appreciative inquiry started as an action research project when David Cooperrider at Case Western Reserve University decided to focus on what brought out the best in the people and the organizations he was studying [20]. Since then, it has developed into both a research approach and an organization development method [21-23]. Today, the approach is widely used by organizations, ranging from non-governmental organizations to large corporations and governmental bodies as a way to increase performance and innovation.

"Appreciative inquiry is about the co-evolutionary search for the best in people, their organizations, and the relevant world around them. In its broadest focus, it involves systematic discovery of what gives “life” to a living system when it is most alive, most effective, and most constructively capable in economic, ecological, and human terms. [Appreciative inquiry] involves, in a central way, the art and practice of asking questions that strengthen a system’s capacity to apprehend, anticipate, and heighten positive potential." [24, p.7]

According to the appreciative inquiry community, the approach leads to benefits such as more informed and more effective change efforts, a critical mass of people making changes they all believe are needed, a total organization mind-set, simultaneous change, and that change is perceived as “real work”. In one of the few studies where the impact of appreciative inquiry has been investigated, Bushe and Kassam [25, p.161] observed that transformational changes were related to two qualities:

“[…] a focus on changing how people think instead of what people do and […] a focus on supporting self-organizing change processes that flow from new ideas rather than leading implementation of centrally or consensually agreed upon changes.”

Appreciative inquiry is a constructionist approach [26] based on the assumption that knowledge is created and interpreted through collaborative social interactions. Often, it is presented as a set of principles forming a philosophy rather than a method. Examples of these principles are that of (a) simultaneity, implying that asking questions have an impact on the
change process, (b) *anticipatory*, that human systems move in the direction of their images, (c) *positive*, that the more positive questions, the more engaged and excited participants and the more successful and longer lasting change effort, and (d) *participatory*, that people perform better and are more committed when they have the freedom to choose how and what they want to contribute.

Over the years, a process model for appreciative inquiry has evolved consisting of five phases (Figure 1). The process begins with *Definition*, in which thoughtful identification of what is to be studied is carried out. The topics selected in this phase become the organization’s agenda for learning and innovation. The selection can be made by top-management or by a group of employees. The next phase *Discovery* aims at appreciating “what is”, and create a collective awareness of “the positive core” of the organization such as achievements, strategic opportunities, technical and financial assets, innovations, core competencies, values and social capital. The positive core creates a solid foundation for the third phase *Dream*. This is an energizing exploration of “what might be”. It provides an opportunity for people to explore collectively hopes and dreams for their work, their working relationships, their organization and their community. During the fourth phase, *Design*, activities expand on the organization’s image of itself by presenting clear pictures of how things will be when the organization’s positive core is boldly alive. The focus becomes determining “what should be”. In the final phase, *Delivery*, focus is on personal and organizational paths for moving forward. Decisions are made regarding what inspired actions to take to support ongoing learning and innovation or “what will be”.

---

Figure 1. Appreciative Inquiry Process Model [27]

Appreciative inquiry has “*a commitment to a democratic and data-driven form of inquiry, and feedback as a way to generate change in human systems*” [23, p.20]. It is an approach that uses a positive lens to guide social action.

Although the objective of the approach is the same as in problem-oriented approaches, i.e. successful change, its emphasis on strengths is in stark contrast to traditional SPI paradigms that tend to focus primarily on problems and the identification of these. Recently, appreciative inquiry has been explored in relation to information systems although not with a focus on SPI. For example, in a series of interviews and focus groups, Avital [28] made IT professionals reveal what they considered contributed to success in projects. In addition to traditional factors already established by research such as project management practice and the communication and relationships culture, personal affect was here also identified as a significant contributor. By using appreciative inquiry as a generative research method, this new factor could be identified. It has also been used in combination with the identification of user needs to form a new approach to systems development: FormIT [29, 30]. Central in this approach is the focus on positive and life-generating experiences and needs of users and other stakeholders. When applying this approach to a specific project, the researchers observed that by using an appreciative storytelling approach for data collection, the authors were able to obtain rich situational knowledge. It also made it possible to capture general needs independent of technical solutions.

According to Avital [28] most of the IS research on system development is grounded in deficit thinking, that is it stems from a need to fix, correct or avoid something. This is
probably a result of the underlying technical design and development paradigm. A “positive lens” approach to IS can be seen as a complementary perspective [31], especially suitable for what Churchman [32] calls “wicked problems”. In such situations, there is no definitive statement of the problem, many stakeholders are involved, and the constraints on the solution often change over time. However, such an approach also requires that all stakeholders can be gathered for a discussion, i.e. that the group has ownership of the issue.

2.3 Contrasting the IDEAL model and the appreciative inquiry model

To further investigate and clarify the differences between the traditional and the alternative SPI approaches we make an attempt to compare and contrast the two models. While they may appear relatively similar, there are fundamental differences. For example, appreciative inquiry includes techniques to bring out the best of peoples’ experiences and appreciate “what is” to create a collective awareness of the positive core. Grounded in experiences of success, future images of “what might be” are formed into a “dream”. Opposite to this, the IDEAL model includes techniques that focus on finding out what problems exist within an organization. In this approach, there is the underlying assumption that if only problems are identified and solved then the organization and its people will perform better. While the two approaches both strive for a better future in terms of improved processes, there is a fundamental difference in how to reach this desired future state and what activities to focus on in reaching this. Also, there is a difference in how learning is viewed. In appreciative inquiry, learning is viewed as an ongoing process, i.e. something that is important and should be brought forward in all phases of the process. In contrast to this, the IDEAL model views learning as an end-product, i.e. something that is achieved in the end of the process after going through all phases. Below (see figure 2), we compare the appreciative inquiry model and the IDEAL model to show differences in their respective phases.

---Figure 2---

Figure 2. The Appreciative inquiry versus the IDEAL model

Independently of SPI model, well known key factors need to be considered when analyzing their applicability. Wiegers [33] claims that - independent of model - lack of adequate management commitment is the first trap to avoid when starting an SPI initiative. In a similar vein, Abrahamsson [34, 35] emphasize management commitment as critical for successful change. Management commitment is in general the far most accepted factor that influences SPI. Other key factors that must be considered are reactions to change [36], the use of opinion leaders [37], user participation [38] and the assimilation gap [39]. Weinberg [36] shows how negative reactions to change can fail an SPI initiative. Rogers [37] claims that the use of opinion leader significantly help overcoming the chasm between early and late adopters. Barki and Hartwick [38] have shown the positive correlation between user participation and successful SPI. The assimilation gap [39] represents the difference between acquired and deployed improvements. Börjesson [40] argues that a first and necessary step is a successful SPI deployment. Therefore, it is of great importance to address challenges related to the assimilation gap when introducing a change process in an organization.
3 RESEARCH METHOD

This paper reports from an eight months (March – October 2006) action research study with the dual goal of improving implementation and use of new processes and tools in practice and contributing to the body of knowledge on the same theme. Collaborative practice research [41] supports the realization of this dual goal and supports the insider/outsider perspective [42] which was a beneficial aspect of this research. The insider role (one of the authors work at the company) assured primary access to data [43] through the change agent role in the researched SPI initiative. The outsider role (represented by the three additional authors) contributed with unbiased reflections. Both the insider and outsider role contributed equally in the research activities such as collecting data, performing interviews and analyzing the result.

Action research has been introduced as a research method for solving practical problems while at the same time expanding scientific knowledge [44, 45]. We applied three characteristics of action research [44]; 1) the researchers were involved in solving practical problems, 2) the knowledge obtained was applicable in practice, and 3) the research was a cyclical process linking theory and practice. Action research, however, is also criticized. Baskerville and Wood-Harper [44] summarize the critique as: lack of impartiality of the researcher, lack of rigor, consultancy masqueraded as research and results not being context free. In our study, we address this critique by using the insider/outsider role of researchers [42] and by triangulation of data [46, 47].

3.1 Research site

This study was conducted in one product-developing unit at the Swedish telecom company Ericsson. The unit involves 65 skilled engineers with more than 15 years of experience working with the Japanese market. Traditionally, the engineers discuss SPI initiatives in terms of ‘problems’ to solve. Over the years, problem-oriented approaches have shaped the mind-set among the engineers who appreciate the challenge of solving problems. The development unit comprise of a department with a department manager, a number of sections with section managers, and a development project with a development project manager (see Figure 3).

------------------------Figure 3---------------------

Figure 3. The structure of the development unit involved in this study.

The aim of the SPI initiative was to enable all affected parts in the unit (marked as striped in Figure 4) to use the same tool (RequisitePro) and process for managing requirements and test cases. This was considered a challenge involving stakeholders with different interests. Moreover, instead of the commonly adopted problem-oriented approaches, this SPI initiative applied appreciative inquiry to facilitate the change process and to encourage a focus on strengths rather than problems in the unit’s work practices.

3.2 Data sources and analysis

Several data sources were used [46, 47] to increase rigor of the findings. Below, table 1 presents the data sources used in this study.
In investigating the change process and how stakeholder relationships unfolded when applying appreciative inquiry, we need to explore relationships between change management intervention and developer acceptance of such intervention over time. In doing this, we adopted Newman and Robey’s [15] social process model of user-analyst relationships as a lens through which to understand stakeholder relationships and how such relationships play out in the change process we studied. In addition, the social process model was used to organize our empirical findings and to describe the sequence of events that occurred in the organization. According to the model, information systems development progresses over time as a series of longer episodes that are punctuated by brief encounters. When change occurs it will be initiated in encounters involving users and analysts. Encouraged by Newman and Robey’s [15, p. 252] remark that the model’s original organizational role differentiation should not be limited to traditional systems development, we differentiate between stakeholders such as change agents and software developers (rather than analysts and users) for our purposes. Viewing a change process as a sequence of events consisting of antecedent conditions, encounters, episodes and outcomes; the model is useful for studying not only preceding events and their outcome but also possible directions for future change. In this model, **antecedent conditions** are situations that existed before the change process. **Encounters** are events that mark the beginnings and ends of episodes. **Episodes** are longer periods wherein the pattern set within an earlier encounter plays out. As recognized by Newman and Robey [15], an encounter can be judged as critical either by the researchers or, in interpretive studies, by the actors in the situation themselves. For the purpose of our study, we believed this lens would be useful to understand how this particular change process proceeded and why certain directions were taken.

Below, we present our findings using this model as the organizing principle. We used a deductive approach to analyze our data, where we went through the notes from the workshops, meetings, and interviews looking for statements, meanings and indications of encounters and episodes. A simple example is the disagreement that occurred at the first workshop, expressed in clear statements, which indicated an apparent encounter along with a clear episode of rejection. To triangulate [46, 47] our data analysis, we separately went through the material. We presented our individual interpretations and compared our identified encounters and episodes. While there was an evident consensus in our analyses, minor discussions and adjustments were needed regarding how to capture the encounters with appropriate labels. The tentative analysis of the encounters and episodes was also presented and discussed with participants from the research site as well as with other researchers at internal seminars to get valuable feedback on our interpretations.

### 3.3 Applying Appreciative Inquiry

Appreciative inquiry was applied in several ways during the project. The approach was introduced at the initial workshop and the participants were almost immediately engaged in strength-based interviews in pairs, answering questions such as “Tell me about examples of successful requirement handling and test and verification”. Then, they were asked to retell the other person’s answer to the whole group, and everybody was encouraged to look for patterns among the answers. Also, a general feedback rule for the workshops was also introduced, i.e. when somebody presented an idea, all other participants were encouraged to tell him/her what
they liked about the idea before offering suggestions for changes. Persons wanting to state what they disliked were encouraged to reformulate themselves constructively and to state what they would like to have instead of what had been suggested. All workshops ended in the same strength-oriented way, with everybody sharing their highlights from the meeting. In addition, the workshops were sequenced to follow the steps in the appreciative inquiry model.

The strength-based appreciative inquiry approach was also used as a guide when conducting our interviews with the project members. For example, we asked them about what they thought had contributed to make the project a success, what their own best contribution had been and what they found valuable in other people’s work. This type of questions was introduced to make the interviewees focus on the strengths they had experienced both in their own and in other people’s work.

It should be emphasised that the SPI project was initiated by the company management because of successful implementations in other parts of the organization. It was thus not the results from an open-ended discussion among the employees on how to improve performance in general. This might be seen as a restriction for the use of appreciative inquiry in that management already decided upon the SPI initiative and the tools to be adopted. However, there was still the possibility to discuss strengths and imagining the future since the solutions suggested within the SPI initiative were very broad. While company management had high-level goals such as shorter lead-time and more efficient test case management, there were details at project level that only participants in our study could assess and reflect upon. In addition, the new tool and the processes related to this were complex and offered much freedom within its framework. Consequently, appreciative inquiry was adopted in a valuable manner even though the opportunities for change were to some extent already decided by company management.

4 THE SPI INITIATIVE

This section begins with describing the antecedent conditions, i.e. the situation and relationships between stakeholders before the initiation of the SPI initiative. We describe the encounters and episodes and how these led to the outcome of the SPI initiative (see Figure 4).

Figure 4. Encounters and episodes in the SPI initiative (episodes are illustrated as lines, which indicate the result of each encounter).

4.1 Antecedent conditions

In March 2006, the management team of a product-developing unit at Ericsson made the decision to improve their requirements and test case management. To strengthen their operation excellence, the management team informally (with participation of one of the researchers in her role as the insider and change agent) analysed possible improvement areas. The informal analysis revealed the following:
a) Requirements were not managed by a known tool for requirements handling
b) Test cases were managed by a high quality tool developed in-house, but only available for a limited number of engineers
c) Requirements and test cases were not documented in a tool deployed by all engineers in the unit
d) Managers and engineers working with requirements and test case had somewhat different views about how to accomplish the most efficient ways for handling requirements and test cases

4.2 Encounters and episodes

Encounter 1: Launch of SPI initiative

In early April 2006, the department manager started the SPI initiative through involving an experienced change agent who works with SPI at Ericsson and has been involved in several similar initiatives within different development units (previously referred to as the ‘insider’). The change agent was asked to commence the SPI initiative. The arrangement included an agreement to run the initiative using a new approach, i.e. appreciative inquiry, which had never previously been used in the company. Besides an interest in the SPI initiative and the success of this, the change agent and three associated researchers would also be able to explore how an organization familiar with problem-oriented approaches could benefit from this alternative approach. After an initial meeting, the understanding between the change agent and the department manager was that the definition phase, i.e. topic of choice, was decided in the development unit’s management team. Consider this statement from the department manager:

“We have now decided to improve our requirements and test case handling. It would be great if you could help us get started”

This statement led to the (unconscious) assumption of the change agent that the first step in appreciative inquiry, i.e. the definition phase, was completed. According to the department manager, a decision to improve had been taken. Based on this decision, the change agent took for granted that the engineers within the unit were aware of the decision and agreed on this. In her view, and according to the department manager, they could now plan the SPI initiative in detail.

Episode 1: Acceptance

The first episode represented a period of acceptance during which the change agent enthusiastically planned different activities. Since the aim was to introduce appreciative inquiry and to explore how the SPI initiative unfolded as a result of this approach, the change agent formed a team of researchers including her and three researchers with different backgrounds. A meeting was arranged with one of the section managers and the research team. At this meeting, the purpose of the project was discussed and a workshop, which would involve all unit stakeholders, was planned. A main goal of the project was declared: “Clear and simple product life cycle requirement and test case handling”. The meeting had a positive atmosphere and as a result, stakeholders were summoned to a workshop. The main interest from the section manager was of course the SPI initiative itself, but he also showed an interest for the appreciative inquiry approach:
“Well, if this new approach can help make this improvement happen faster- and better- that would be just fine”.

**Encounter 2: Disagreement about “determine what should be”**

Episode 1 led to the first workshop where all stakeholders attended, apart from the elsewhere engaged department manager. Because the change agent took for granted that the first phase in appreciative inquiry, i.e. definition, was agreed upon, the workshop was arranged to proceed with the following phases. The goal of the workshop was to reach the result of a detailed plan of how the SPI initiative would continue towards implementation. At the workshop, during the second phase of appreciative inquiry, i.e. ‘discovery’, the participants enjoyed interviewing each other to discover positive experiences. The participants seemed comfortable asking each other what they considered their strengths and their core competences. During the next phase, i.e. ‘dream’, the participants had a positive dialog about what they wanted to create. They all wanted to improve the requirements and test case management and they could all see the benefits of doing so. However, the participants sometimes found it difficult to express themselves in appreciative terms. For example, when asking the participants what they thought was the most positive aspect of an idea, many of them answered very briefly and one participant said:

“Why can’t we tell what wasn’t good? Why are we only allowed telling what was positive?”

Even though this was the case during the workshop, the two section managers acknowledged the benefits of the approach afterwards in the interviews:

”It was different because we looked at possibilities, but focusing on problems is so deeply rooted that we easily slipped back to that way of thinking”

“The habit of focusing on problems made us a little inhibited, but it was positive to focus on what was good”

The ‘discovery’ and ‘dream’ phases were finished satisfactorily. The change agent (who was running the workshop) as well as the participants seemed to enjoy the opportunity of interaction between sections. However, when reaching the next step, i.e. ‘design’, it became apparent that people involved were in serious disagreement. In this phase, participants are expected to determine ‘what should be’. In a discussion regarding generation and use of test case documents, some stakeholders expressed that they were not familiar with the referred material. Stakeholders from the section generating these documents did not agree on this and were quite irritated:

“Yes, you are familiar with these documents – and you do read them!”

One of the section managers described the emotionally charged situation as follows:

“Before the workshop it was assumed, but not explicated that we should implement the RequisitePro tool to improve the requirements and test case management. ...Then we were summoned to the workshop...I felt irritated already before, and had decided that this was no good...”.

At this point, it became clear to the change agent that the assumption that the definition was agreed upon was a mistake. Clearly, the participants did not fully share views. The definition had never been agreed upon and, therefore, participants could not agree on ‘dreams’ and
‘design’. What also became clear was that there were tensions between stakeholders due to differences in previous investments and efforts.

Because of the disagreements and the insight that the definition phase was not yet established, it was not fully possible to complete the goal of the workshop. Instead, the workshop left key stakeholders with different issues to clarify before the SPI initiative could continue according to plans. In the interviews afterwards, one of the section managers expressed his view of the workshops:

“The first workshop was very valuable to us since it surfaced our differences, and made us realize that we did not agree”.

**Episode 2: Rejection**

The result of the workshop was a period of rejection on the part of the stakeholders. There were different views of whether an SPI initiative should take place at all, and if so, how it should be done. However, the department manager stood by the decision and supported the change agent in proceeding with the SPI initiative. With the aim to resolve the rejection, the change agent started planning for a meeting between some of the key stakeholders that had been in disagreement at the workshop.

**Encounter 3: Follow-up meeting**

Episode 2 led to the arrangement of a follow-up meeting. The meeting involved the two section managers responsible for requirements and test cases. This meeting was held in June with the aim of finding a way forward and to resolve the tensions that had occurred during the workshop. The two section managers’ ability to reflect in an unbiased way on what had actually happened at the workshop greatly facilitated the process of moving forward. At the follow-up meeting, one of the section managers said:

“…we should of course have been more prepared – should have had a common agenda…it was stupid to even think that we could come to the workshop without having had discussions beforehand”.

At the follow-up meeting, the section managers agreed on the importance to proceed with the SPI initiative, and agreed on the decision to arrange a second workshop. This workshop would emphasize the importance of the SPI initiative and the aim would be to get participants to proceed with the interrupted design phase and agree on ‘what should be’.

**Episode 3: Equivocation**

After the follow-up meeting, the section managers conveyed the outcome of the discussions they had with each other and with the change agent to the rest of the group. There were no particular reactions in the group and most participants seemed to take a more neutral position waiting for the second workshop at which the design phase would continue.

**Encounter 4: Forming the workgroup**

Episode 3 led to the arrangement of the second workshop with all main stakeholders attending, except for the department manager. While most of the stakeholders had remained passive during the episode of equivocation, the department manager had re-established the focus of the SPI initiative, i.e. he completed the definition phase. Stakeholders now agreed to implement RequisitePro and the SPI initiative could continue. Because of this basic agreement, workshop participants were able to discuss how to design and implement RequisitePro and its related processes. By focusing on the positive core and ‘what should be’,
workshop participants were able to agree on a concrete time plan. At the workshop, it was clear that the attention from the project manager helped make a concrete time plan. Also, the workshop rendered in the creation of a workgroup that would manage the ongoing SPI initiative and deal with the details of design and delivery. One of the software engineers said afterwards in the interviews:

“The workshops enabled different viewpoints to be put forward. Usually, one focuses on the person that speak loudest”.

**Episode 4: Acceptance**

The stakeholders agreed on the workgroup and a period of acceptance came as a result. During this period, stakeholders were scheduled to leave for summer holidays, which put additional pressure on the work. At this time, the SPI initiative got assistance from another change agent specialized on the RequisitePro tool. The formal interviews, conducted after the SPI initiative was completed, show the importance of this additional change agent:

“Without the help from our change agent we would never have been able to complete the transformation into RequisitePro in time... he helped us with all kinds of things from explaining to people how the tool works to help us with the actual work in RequisitePro...”.

However, at this time, the SPI initiative was already running late and the change agent could not all by himself bring it back on track before people returned from holidays. While tremendous progress had been made in some areas, there were still areas in which progress was slow.

**Encounter 5: Management directives**

According to the time plan, the SPI initiative was supposed to be ready for demonstration in August. However, the project manager soon identified a lack of progress. Despite considerable help from the additional change agent, not all sections were performing according to the plan and the assigned working group had trouble managing this. During this period, the differences between the sections in terms of existing structures became apparent. Stakeholders realized that if this situation continued, they would fail to keep up with the time plan. Due to these difficulties, the project manager identified the risk of the project running late if resources were not re-prioritized.

At this point, the project manager took an active role and with support from the department manager resources were re-prioritized. In discussions with the section managers, it was emphasized how important the SPI initiative was and that high prioritization was necessary in the sections’ everyday work.

“We discussed what needed to be done and how we could solve the issue with requirements elicitation for the unit experiencing problems. This was very important for getting the process going again”.

Because of the project manager’s early discovery of problems and management directives as a response to this, they could maintain the time plan and work could continue according to the plan.

**Episode 5: Acceptance**

Following the management directives, the SPI initiative continued smoothly. During this episode, the software developers and the delayed section worked together with the change
agent to accomplish the transition to the RequisitePro tool. In addition, they made preparations for a first presentation of the system.

**Encounter 6: Presentation of results from the SPI initiative**

In August the first presentation of the result from the SPI initiative was held. This was the first time the full potential of the SPI initiative result was evaluated and discussed among participants. The presentation was very successful and the overall feeling after the event was positive:

“At this meeting all people were very positive! It felt like a springboard…”.

Clearly, the presentation was appreciated and for the first time the different stakeholders got a shared view of the potential of RequisitePro. From an appreciative inquiry perspective, this was the time for ‘delivery’, i.e. the first time that stakeholders got a feeling for ‘what will be’. Despite challenges that were identified, the presentation had a value in that project members left the room with a positive attitude and a feeling of “we will succeed”. This feeling had a positive impact for the organization in that people started talking about RequisitePro in a positive manner. The tool was no longer related to only problems and resistance but rather the opposite in that people now highlighted its potential and the great effort that people had put in when developing the system.

**Episode 6: Acceptance**

Following the presentation, RequisitePro was implemented and the different company sections had to use the same system for requirement and test case management. According to one of the software engineers, the idea of having one common system was important:

“I think that having the sections using the same system is crucial. ... Before it was only very few people that were aware of this process…”.

As can be seen in this statement, the new tool did not only offer the sections a common tool for test case management. In addition, the development of the new tool had made the sections to evaluate and re-consider their test case processes. From being processes known by only a few people, the development and implementation of the new tool had brought attention to these processes and made more people aware of them. Still, at that point in time the RequisitePro tool had only been in use for a very short time and therefore it was be difficult to evaluate the full potential of the system. Although, most stakeholders seemed to find the SPI initiative very successful:

“I am very happy with the initiative. Of course, it has not been without struggle and disagreement – but why should it? Not only did we succeed in implementing a new tool – but we did it using a new approach, which nobody at the company had experienced before. Overall, the project has involved many people and we have learnt a lot. After the demonstration of the system, I think we were all convinced that this is indeed an improvement and that the system will definitely serve its purpose. To me – this is what you can expect in an SPI initiative like this”.

“I think the project is a success. Even though we haven’t had the chance to work with the system for very long I think it looks good. There is always a little resistance but after a while people start realize the benefits with the system…also, we learnt a lot from the process”.
One important aspect that can be found in all the statements above is that most stakeholders found the SPI initiative successful as a learning experience. Not only did the initiative result in the development of a new tool, but also the organization learnt a lot about its common processes. At the workshops, dependencies among sections was put attention to and stakeholders from different sections got the opportunity to describe and compare their work in a way that is not easily achieved in everyday practice where time is pressured. In this way, the SPI initiative, and the use of appreciative inquiry, helped put attention to important work processes and how to improve these in a constructive way.

Overall, the SPI initiative was considered very successful. In the interviews, software engineers expressed:

“As a change initiative considered, this process has been better than usual.”

“It has been a structured working process, which is an advantage”.

Despite limited use so far, benefits can already be seen and stakeholders are convinced that the implementation of RequisitePro will result in more efficient ways of working.

**Outcome: Successful SPI initiative**

In the end of October 2006, a monthly steering committee meeting was held where one of the section managers involved in the SPI initiative was invited to report progress and outcome. In the presentation, it was made clear that the SPI initiative was considered very successful and that the new RequisitePro tool and its related processes would mean an increase in efficiency, quality and visibility. According to the report, this increase in efficiency meant an estimated cost saving of approximately 80,000 €/year, which the steering committee considered a very good achievement.

In late 2007, RequisitePro is still used within the product development unit and it provides their development projects with structure and control. The manager for requirements handling claims “…the traceability between the requirements, the change requests and the test cases are important for us to be able to control our development projects”. The introduction and implementation of the RequisitePro tool can be seen as having been institutionalized [48] within the product development unit.

### 5 DISCUSSION

In our study, we have explored an SPI initiative and how it unfolded when a strength-based approach, i.e. appreciative inquiry, was used instead of the commonly employed problem-oriented approaches. More specifically, our research questions were:

- How does the use of appreciative inquiry influence known key factors for success in an SPI initiative?
- How does the use of appreciative inquiry impact individuals familiar with problem-oriented approaches?

The analysis provided us with a range of findings related to the use of appreciative inquiry in organizations familiar with problem-solving approaches. Below, we present our findings structured according to the two research questions. We conclude the section by suggesting further research in the area.
5.1 Appreciative inquiry and key factors for improvement success

Our study shows that the SPI initiative struggled with the same challenges most SPI initiatives do. When analyzing encounters and episodes, we see that traditional key factors such as management commitment, reactions to change, use of opinion leaders and attention to deployment all had impact on this SPI initiative. First, the management commitment [34, 35] was a key factor for the success of this SPI initiative. The department manager was involved twice to sort out conflicts, make prioritizations and give directives in favour of the SPI initiative. It is very likely that the SPI initiative would have failed without these efforts from management. However, it is most likely that attendance from the department manager at an even earlier stage would have facilitated progress of the SPI initiative. As recommended by the appreciative inquiry approach the whole system, i.e. all stakeholders, should ideally be present when engaging in activities such as workshops. This was indeed the ambition in this project, but due to unfortunate circumstances, the department manager was elsewhere engaged at both initial workshops. This proved unfortunate for the initial phases of the SPI initiative.

Second, negative reactions to change are common [36]. Our study shows that such reactions can make an SPI initiative fail. The negative reactions to change became apparent in our study when the stakeholders realized that they had very different perceptions of the current situation. In addition, they realized that there had never been an agreement regarding the definition of the project. At this point, we experienced a noteworthy level of unwillingness or inability among the stakeholders to fully comprehend the current situation and engage in the activities necessary due to the need of change. Although we had introduced the appreciative inquiry approach with its emphasis on strengths and a positive lens, the stakeholders struggled with their negative reactions to change. We believe that this challenge became even more evident in this particular study since the change required by the SPI initiative, i.e. the implementation of a new process and tool for requirements, is in itself a big change. In addition, there was the change required by the appreciative inquiry approach, i.e. the change from a problem-oriented mind-set to a strength-based attitude. This might be seen as a radical change as the field is grounded in deficit thinking in general [28] and therefore even more challenging as opposed to changes of a more incremental character [49].

Third, as in most SPI initiatives, opinion leaders proved crucial in this SPI initiative. Opinion leaders are individuals who provide information and advice to other individuals [37] and they are well known as key factors for SPI success. In our study, the change agent introducing the SPI initiative as well as the appreciative inquiry approach was critical. In many encounters, the change agent had to moderate discussions to make progress when the stakeholders were in conflict. In addition, the RequisitePro specialist was highly appreciated among stakeholders and became an important change agent during this project. As a change agent, the specialist provided competence, advice and contributed to practical work. The final interviews revealed that this effort was of great assistance for progress in the SPI initiative. From this, we conclude that strong opinion leaders play an important role also when using strength-based approaches such as appreciative inquiry as the approach for change.

Fourth, acquired technology is not the same thing as deployed technology [39]. While the development unit had indeed access to RequisitePro for a long period, there was no spontaneous deployment of the technology at first. In contrast, it was not until the department manager together with the change agent gave directives along with concrete support that...
people actually started using the technology. As in other SPI initiatives, conscious deployment proved critical also in this project.

Based on experience from our study, the SPI initiative struggled with many of the same challenges that most SPI initiatives do. When analyzing encounters and episodes, we learned that traditional key factors such as management commitment, reactions to change, use of opinion leaders and attention to deployment all influenced this SPI initiative. These key factors need to be considered when analyzing different SPI approaches and their applicability in different contexts. This indicates that the importance of traditional key factors do not diminish when appreciative inquiry was used. Hence, we conclude that the use of appreciative inquiry does not eliminate the dependence of other well-known key factors for SPI success.

5.2 Appreciative inquiry versus problem-oriented approaches

In the development unit at study, all engineers were familiar with problem-oriented approaches and appreciated the challenges involved in identifying and solving problems. As we see in many problem-oriented models, e.g. the IDEAL model [7] and the DMAIC model [8, 9], they all have phases that focus on identifying and finding solutions to problems. The engineers in our study were not only accustomed to use these methods, but also enjoyed the challenges related to identifying and solving problems. It became apparent at the workshops how the majority of the engineers were less enthusiastic regarding the activity to ‘imagine what might be’ or ‘determine what should be’ while effortlessly engaged in identifying and solving problems. However, it was also clear that in retrospect, the participants could identify benefits with the approach such as focusing on possibilities and strengths, that the approach helped surface disagreements and enabled different viewpoints to be heard in the process, as well as provided a structured change process.

While appreciative inquiry focuses on creating a collective awareness of the positive core, problem-oriented people who are trained and skilled in problem solving struggle when encouraged to collectively explore ‘hopes and dreams’. Although this had not been a problem when using Appreciative Inquiry when identifying user needs [29, 30], the conditions were different. The target group was not engineers and thus not part of the problem-solving paradigm, and the approach was also combined with a strong focus on narratives. In our case, it was noticeable that there was a tension between the problem-oriented mind-set and the strength-based appreciative inquiry approach. This is an interesting feature of the study and we conclude that extensive training and support in terms of a facilitator familiar with the appreciative inquiry approach is critical for exploring the full potential of the approach. One aspect of this is to use other concepts, more oriented towards a business setting as suggested by Faure [50] such as Initiate, Inquiry, Imagine and Innovate.

As pointed out by Bushe and Kassam [25], appreciative inquiry focuses on changing how people think instead of what people do. Already in the beginning of the SPI initiative, there was unwillingness among stakeholders to emphasize positive experiences and talk in terms of opportunities rather than problems. Our attempt to shift the software engineers’ mind-set from problem-solving to creating dreams and emphasize strengths proved a great challenge. Looking back at our attempt, it is plausible that we tried to implement a new approach without fully considering the basis of the problem-oriented mind-set. While appreciative inquiry has been successfully used in many organizations [22, 25, 51], we conclude that the preference and satisfaction of problem-solving among individuals familiar with problem-oriented approaches may impede the use of appreciative inquiry. However, it should be
emphasized that not only did the participants in this study have to learn and reflect on a new method, i.e. appreciative inquiry. The SPI initiative itself, i.e. to implement a new tool for test case management was their primary challenge and in itself an ambitious attempt. Hence, our experiences when applying appreciative inquiry should be put in relation to the fact that the participants were part of an organizational change process. To experience this change process at the same time as adopting a strength-based method that doesn’t reward a problem-oriented mind-set to the same extent as the participants were used to, might have influenced the results and the way in which appreciative inquiry could be applied.

While there generally is a need of careful training and guidance to benefit fully from any approach and its strengths, it seems that appreciative inquiry not only require careful training, but also time to enable reflections and the formulation of narratives. Given the focus of the approach to change how people think [25] and introducing new practices of inquiry to strengthen and bring out the potential of a system [23, 29, 30], it seems reasonable that it would take some time to achieve such behavioural changes. This is in line with Bushe and Kassam’s findings [25], stating that few Appreciative Inquiry initiatives has lead to transformational changes, that is changes in the identity of a system and qualitative changes in the state of being of that system. One reason for this is lack of time spent on creating generative metaphors, that is sayings or phrases that are in themselves provocative and can create new possibilities for action that people had not previously considered. Their data also indicates that more radical use of Appreciative Inquiry such as for example letting go of control during the Delivery phase as beneficial.

It should be acknowledged that relatively little time was spent on introducing appreciative inquiry in this SPI initiative and generative metaphors were not used at all. Therefore, it is possible that the use of appreciative inquiry would have been even more beneficial if the stakeholders involved in the project had had the opportunity to learn more about the approach in the early phases of the SPI initiative, or even before the process started and that a more elaborate version of the process had been used.

5.3 Implications for research and practice

Since this was our first attempt to introduce a strength-based approach such as appreciative inquiry into an organization familiar with problem-oriented perspectives, we can report on lessons learned as well as the need for future research within the area. In reflecting upon our own research approach, and to be able to fully explore the potential of the appreciative inquiry approach, we see it as a relevant task to find better ways of introducing appreciative inquiry into organizations where problem-oriented perspectives are dominant. During the project it became evident that in order for us as researchers to introduce appreciative inquiry and to be able to mediate its potential to the practitioners familiar with opposite traditions, we need more experience from using it as a guiding principle in our own research. To gain such experience it will be of importance to adopt a strength-based perspective throughout the research process and to reflect upon our individual contributions in such a way that strengths are brought forward rather than failures or problems. In this, we see the potential to use appreciative inquiry as a method for generative theory-building [28, 52-54]. This, however, would require us to rethink our research process in terms of what we want to accomplish with our research, who should participate and when, what we focus on in our analysis, and how we present our results. This will be a challenge for individual researchers as well as for the research community as such.
Probably, a fruitful way of introducing appreciative inquiry would be to first acknowledge the strengths of the problem-solving tradition and, in addition to this, demonstrating the potential with using appreciative inquiry for improving complex issues. As can be seen in research within the area, problem-oriented perspectives are useful when dealing with technical challenges while strength-based approaches such as appreciative inquiry seem appropriate when dealing with “wicked problems”, i.e. complex issues involving many stakeholders and where there is no definite answer [55]. Today at Ericsson, we study how post mortem evaluations (PMEs), which are often associated with negative experiences as well as barriers for conduct, can be improved by adopting the appreciative inquiry approach. In this study, we develop a method for PMEs using appreciative inquiry to balance the focus on experienced challenges and excellences to address. The method with its balanced perspective has shown promising indications of turning the evaluations into more positive experiences enabling people to appreciate and share previous experiences as well as generate constructive suggestions of actions.

6 CONCLUSION

This paper reports from an action research study at the Swedish telecom company Ericsson. The dual aim of the study was to improve implementation and use of new processes and tools in practice and to contribute to the body of knowledge about the use of appreciative inquiry. The focus of the study was to understand what happens when introducing a strength-based approach such as appreciative inquiry in an organization familiar with problem-oriented approaches for SPI. Whereas the SPI initiative was successfully implemented in the company, important lessons were learned regarding the use of appreciative inquiry. Based on our empirical findings we conclude that:

- The use of appreciative inquiry does not eliminate the dependence of other well-known key factors for SPI success.
- The preference and satisfaction of problem solving among individuals familiar with problem-oriented approaches may impede the use of appreciative inquiry.

This study complements and extends previous research on SPI by introducing appreciative inquiry as an alternative approach to organizational improvement and change. With its strength-based characteristics, appreciative inquiry is in stark contrast to the problem-oriented focus underlying the SPI paradigm. Clearly, the adoption of alternative approaches to SPI will require further research, but we suggest that the appreciative inquiry approach adopted in this study can provide interesting insights and a useful foundation for future research within the field.

REFERENCES


<table>
<thead>
<tr>
<th>Data Sources</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct involvement</td>
<td>The researchers were involved in workshops and meetings where the SPI initiative was initiated, planned, executed, analyzed and evaluated.</td>
</tr>
<tr>
<td>Participatory observations</td>
<td>During workshops and meetings, three of the researchers took the outsider role (taking notes) while one of the researchers (the insider role) was directly involved in the activities.</td>
</tr>
<tr>
<td>Formal interviews</td>
<td>Six formal interviews were conducted. Each interview lasted for 30 minutes. During the interviews, two researchers asked questions while the two other researchers took notes.</td>
</tr>
<tr>
<td>Open-ended, semi-structured interviews</td>
<td>Due to the insider role daily informal discussions concerning the SPI initiative were possible. These informal discussions allowed for insight in everyday practices at the company.</td>
</tr>
<tr>
<td>Project documentation</td>
<td>Due to the insider role the research project had access to manager documentation, planning documents and progress reports.</td>
</tr>
<tr>
<td>Product documentation</td>
<td>Due to the insider role the research project had access to the requirements and test product documentation.</td>
</tr>
<tr>
<td>Tool data</td>
<td>The research project had access to the RequisitePro tool which was the tool implemented in the SPI initiative.</td>
</tr>
</tbody>
</table>