Fraunhofer Institut
Experimentelles
Software Engineering

Software Engineering Networking Experience

1st International Workshop, WSSENE 2006
Joenssu, Finland, October 2006
Proceedings

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IESE-Report No. 138.06/E
Version 1.0
October 11, 2006

A publication by Fraunhofer IESE

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Abstract

In the last years, many national and some European initiatives have been started that aim at transfer and exchange of experience on several software engineering related aspects.

Some of the aforementioned initiatives have been successful like the national German VSEK project (www.software-kompetenz.de), others failed to achieve sustainability or other key performance indicators.

The objective of the 1-day workshop is to foster the exchange of experience with regard to the set up and operation of networking activities in the area of Software Engineering. A special focus is on experience regarding measures that have been implemented in order to foster the exchange in the very networks and to assure sustainability. Reports on lessons learned should also comprise quantitative as well as qualitative indicators that have been observed in order to assess success. The workshop aims at collecting a comprehensive list of successful as well as less successful implementations of the various measures, either on technical, social, or process level.

The 1st Workshop on Software Engineering Networking Experience takes place in conjunction with EuroSPI 2006 Conference in Joenssu, Finland.

Keywords: software engineering, networking, technolgy transfer, experience

Acknowledgements: We gratefully acknowledge the support given by the organizers of the EuroSPI conference, especially Dr Richard Messnarz, Director ISCN and General Chair EuroSPI Initiative as well as Nils Brede Moe SINTEF, and Adrienne Clarke from the ISCN office.

Planning and Organization of the Workshop has been funded by the German Ministry of Research and Eduction in context of the public project VSEK, FKZ IS 01 C39.

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1 Introduction

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Some of the aforementioned initiatives have been successful like the national German VSEK project (www.software-kompetenz.de), others failed to achieve sustainability or other key performance indicators.

1.1 Objectives

The objective of the 1-day workshop is to foster the exchange of experience with regard to the set up and operation of networking activities in the area of Software Engineering. A special focus is on experience regarding measures that have been implemented in order to foster the exchange in the very networks and to assure sustainability. Reports on lessons learned should also comprise quantitative as well as qualitative indicators that have been observed in order to assess success. The workshop aims at collecting a comprehensive list of successful as well as less successful implement¬ations of the various measures, either on technical, social, or process level.

1.2 Benefits for attendees

Attendees will get an extensive overview on the current practice in technology transfer between research and industry as well as networking activities. They will learn what other networks have used in order to be successful and how they rate their success. Furthermore, attendees are expected to get in contact with other networks and lots of interesting people, both from practice and from research. Results will be published in a Springer LNCS proceeding.

1.3 Areas of interest

For a workshop on exchange of experience on concurrent networks for ICT professionals, it is reasonable to address in particular topics such as

I. Networking of ICT Professionals

What is the information need / users' expectations

II. Community Building for/amongst ICT Professionals

Barriers and models for successful cooperation (Research - Industry – Industry – Research)

III. Experience Exchange for/amongst ICT Professionals

Infrastructure and business models

1.4 Participants

According to the objectives of the workshop the participants should have experience in the set up as well as in the operation of networks dedicated to the exchange or transfer of experience. Since those networks are initiated by both, industry and research we expect participants from both areas.

1.5 Structure of contributions

1. Motivation

2. Goals and Objectives

e.g, what is the objective of the network, what is the audience of the network

3. Procedures and Artifacts necessary/mandated/provided

What are the measures that have been implemented on a network process and content level (e.g., what kind of experience, what kind of documents / Content

4. Methods and Tools applicable/ necessary/mandated/provided

What are the measures that have been implemented on a technical and social level (e.g., events, forums,)

5. Characteristics and metrics for benchmarking respectively evaluation and Assessment

6. Results regarding the objectives and Lessons Learned

7. Future Work

To get a comprehensive understanding of the state of affairs it is reasonable to distinguish respectively include in the discussion of each of these topics not only engineering and managerial but also the economic aspects as well. Submission contact and address: see below.

1.6 Organization

Workshop Chairs

Andreas Jedlitschka and Ralf Kalmar (Fraunhofer IESE, Kaiserslautern, Germany)

Program Committee

Torgeir Dingsøyr, SINTEF Norway	Bernhard Josko, OFFIS Germany
Corinna Floeck, ECP France	Elixabete Ostolaza, ESI Spain
Hans-Ludwig Hausen, Fraunhofer FIT Germany	Thomas Zehler, University Cottbus, Germany

2 Workshop Agenda

9:00 **Opening, Motivation**

9:15 **SPIN-syd – a non-profit exchange network**

Per Runeson, Per Beremark, Bengt Larsson, Erik Lundh

SPIN-syd is a software process improvement network in southern Sweden, which has been active for more than 10 years. It was founded in 1995 and is run on a non-profit basis with active representatives from about 30 companies, and faculty and PhD students from the university. The main objectives of the network are exchange of experiences between companies, benchmarking and industry-academia cooperation. Focus is on the quality perspective of software engineering..

9:45 **Outcomes from six years of Software Process Improvement Networking in Rio de Janeiro**

Renata Mendes de Araujo, Claudia Cappelli, Thiago Andrade, Mauro Lopes

The results of a six-year experience on organizing and maintaining a SPIN (Software Process Improvement Network) in Rio de Janeiro, Brazil are presented. The talk will present survey data, SPIN-Rio meetings, and will discuss the factors that made it successful and active until now. It also discusses some impact indicators of SPIN-Rio activities improving professionals, organizations and the local software market. Finally, the objectives of a research project, which aims to provide new alternatives to enforce the collaboration and knowledge management among professionals are presented.

10:15 **The Virtual Software Engineering Competence Network softwarekompetenz.de**

Ralf Kalmar and Andreas Jedlitschka

The virtual software engineering competence network "softwarekompetenz.de" brings together software professionals from research and industry and provides access to a comprehensive pool of knowledge by means of technology descriptions and related experience. The targeted audiences are especially small and medium-sized companies (SME). The talk discusses long-term operation and financing of the network.

10:45 ***Break***

11:15 **Regional Exchange of Knowledge between ICT Professionals from Industry and Research: The social differentiation of interests and practices in the theory of Pierre Bourdieu**

Claudia Mueller, Bernhard Nett

A case study presents a regional network analyzed using Bourdieu's Social Capital concept. This analysis shows prerequisites of knowledge exchange processes in successful networks. Therefore, the Bourdieu's theory is presented as a valuable tool for the analysis of regional networks.

11:45 **Discussion**

* Identification of questions

* Discussion of challenges and solutions

13:00 **Lunch**

14:00 **Results from Technology Transfer Workshop in Dresden**

Heike Eekhoff, Andreas Jedlitschka

Presentation of results from a workshop on exchange between research and industry. Perceived benefits and problems.

DISCUSSION AND COLLECTION OF IDEAS

14:30 **Organisation of Networks**

15:00 **Problems and Benefits**

15:30 ***Break***

16:00 **Success Factors**

16:30 **Possible Next Steps**

17:00 End

3 Accepted Papers

SPIN-syd – a non-profit exchange network

Per Runeson, Per Beremark, Bengt Larsson, Erik Lundh

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Abstract. SPIN-syd is a software process improvement network in southern Sweden, which has been active for more than 10 years. It was founded in 1995 and is run on a non-profit basis with active representatives from about 30 companies, and faculty and PhD students from the university. The main objectives of the network are exchange of experiences between companies, benchmarking and industry-academia cooperation. Focus is on the quality perspective of software engineering. The network activities comprise an e-mail list, regular three-hour network meetings, temporary working groups and an annual conference. The network is kept running through a core group of pioneers, although the number of members is fluctuating and the activity level always is an issue. Working groups suffer from resource constraints, which can be solved when university researchers or PhD students take a moderating role. The format of the network is under continuous discussion.

1 Motivation

Since 1995, the SPIN-syd network has existed in southern Sweden, around the cities of Malmö, Lund and Helsingborg. Representatives from companies with a major part of their business in software decided to set up a SPIN to share experiences and stimulate to software process improvement initiatives in the respective companies. Among the major software industry players in the region are ABB, Ericsson, Sony Ericsson, Telelogic and IKEA IT, but many medium and small companies are also involved in the network. The activities are non-profit and based on a voluntary basis.

2 Goals and objectives

The main objective of the SPIN-syd network is to share experience and practices among companies which have a major part of their business related to software. In the first annual meeting, SPIN-syd was defined as “an open network for exchange of knowledge, innovations and practical experience about improvement of the software engineering process”[1]. The purpose was stated to “strengthen the competitiveness of

[1] Magnus Ahlgren, at SPIN-syd’s spring conference 1997.

the software industry in southern Sweden through better software processes, and consequently better software." [2]

The topics for the network are software process improvement issues, with a specific focus on software quality assurance and quality management issues. Originally, the network had a clear CMM focus, as many members worked on CMM-based improvement programs at that time. Gradually, the topics have moved towards more general software quality, development and software process improvement issues.

The members of the network are quality managers, practitioners in software quality organizations, consulting experts, and from the academical side, faculty and PhD students.

3 Procedures and artifacts

The SPIN-syd network is characterized by its voluntary and non-profit characteristics. The network has neither an elected board, nor a budget. Decisions are made on the network meetings by those members present. The member companies fund their employee's time spent in meetings and working groups. The meetings are hosted at the companies' and the university's premises, and the only expenses are for coffee and refreshment for the meetings, which the hosting organizations pay for.

Companies can apply for membership in the network. They are accepted at the network meeting, after a poll on the network's e-mail list. Each company must assign a contact person, which has the responsibility of representing the company in the network. In addition to the contact persons, other employees of the organization may attend the meetings and take part in working groups.

The network has a very open atmosphere. Professionals share willingly their problems and solutions regarding software development processes and practices. There are no direct competitors among the product companies, rather companies from different application domains learn from each other. We have for example seen successful examples of exchange between regional branches of Ericsson and Sony Ericsson from the telecom domain and a regional branch of ABB from the automation domain. Among the consultancy companies, there are competitors, but they handle this very professionally and leave direct marketing and recruitment issues outside the network. The network has lead to new business and recruitments across the member companies, but this is handled outside the network meetings.

The academical side of the network is represented by faculty and PhD students from Lund University. Research groups on software engineering and software technology take part in the network. Both belong today to LUCAS – center for applied software research at Lund University.

[2] Magnus Ahlgren, at SPIN-syd's spring conference 1997.

4 Methods and tools

SPIN-syd has four kinds of tools for the networking:

- An e-mail list
- Regular three hour meeting
- Working groups
- An annual conference

The e-mail list is used for all communication within the network. Members companies connect at least one e-mail address to the list. The list is maintained on a voluntary basis. There have not been any problems with misuse of the list. There are no defined regulations for the use of the list, but informal agreements state that the messages sent should be of interest to the audience. In addition to the information flow in the network, announcements of seminars and conferences on software-related topics are sent out. Periodically, a web server has been in use, but currently it is not up-to-date due to lack of volunteers.

The main and regular manifestation of the network is the meetings. They are held (almost) monthly, except for summer and Christmas periods. Lately, the first Tuesday afternoon in each month has been scheduled for the meeting. The meeting has two parts, 1) a member meeting where issues on the network as such are discussed and decided upon, e.g. hosts for coming meetings, program for the annual conference, and new working groups; 2) an open meeting where the host and other members of the network give presentations on topics that are of interest to the audience. The first part is about one hour, and is intended for the contact persons of each member company. The second part is 2-3 hours, depending on the topic. The host decides on the agenda, sends out an e-mail invitation and writes meeting minutes, which are distributed via e-mail.

Working groups are formed by members based on interest for a proposed topic. Mostly, a working group is conducted in the format of a series of meetings. Working groups may also involve a more structured format of benchmarking and exchange. Working group results are reported in technical reports, research papers and presentations in network meetings and annual conferences.

The annual conference – which unfortunately has not been held every year – is a chance to broaden the contact surface towards other companies and other employees of the member companies. The audience is defined as project and middle managers in software engineering. In the conference, member companies and the university present recent work, e.g. from the working groups. Invited speakers give a talk on a topic of interest for the audience.

5 Characteristics

The SPIN-syd network is characterized by its open and trustful character. It is based on “gentlemen’s agreements”, and only in specific cases, non-disclosure agreements are signed. As mentioned above, there are no direct competitors among the product software companies, which fact eases the openness.

Being totally dependent on voluntary work, working hours are a limited resource. In some working groups, faculty members or PhD students from the university act as chairmen and secretaries. If the working groups are in line with their research focus, they have more time to spend on the working group and get it running.

The network is based on company and personal incentives. Only those who gain from the network attend the meetings. The commitment is not contracted, but dependent on that the attendants experience that the time they spend on the network pay off in their business. The incentives are different for different types of members:

- Product software companies – gain knowledge for their work
- Academicals – conduct empirical software engineering research
- Consulting experts – gain knowledge and market their services

6 Results

The SPIN-syd network has created lots of results; a few of them are visible and countable while the major part is not, e.g. contact networks, improved software business and personal satisfaction. In this section, we report some statistics and tangible results from the meetings, working groups and the annual conferences.

Meetings

The attendance statistics are collected from 1998 and onwards. The number of meetings per year is shown in Fig 1a. It used to be six meetings per year, but has from 2000 changed into 8-9 meetings, i.e. monthly except during summer and around Christmas time.

The number of companies participating in at least one meeting per year is shown in Fig 1b. Around 30 companies take part each year. However, there are still another 25 passive members in the network, as the number of registered companies is about 55.

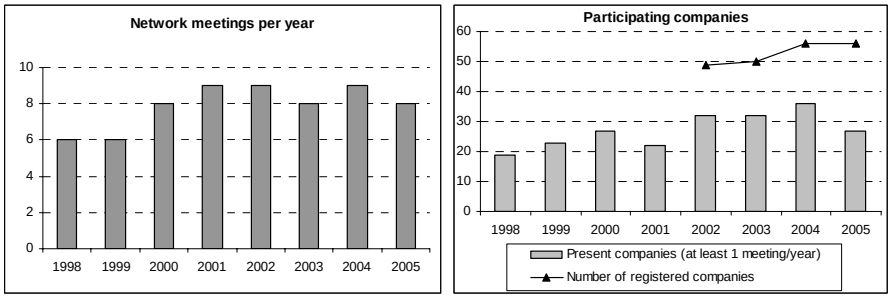

Fig. 1. a) SPIN-syd network meetings per year and b) participating companies in the meetings.

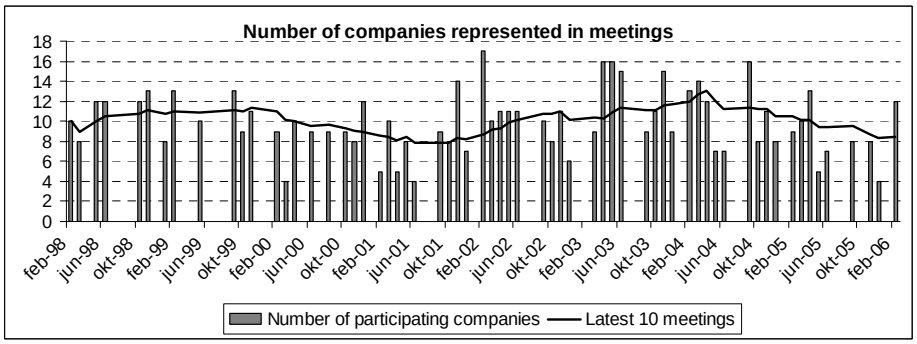

Fig. 2. Number of companies represented in each meeting.

Fig. 2 shows the number of attending companies per meeting. There is a variation between 4 and 17 companies per meeting, with an average of about 10. The activity level is, as the statistics show, varying. What is not visible from the statistics is that there is a very central core of say 4-5 members that almost always attend the meetings.

Every now and then, the discussion is raised whether the list of registered members should be purged with respect to activity level. Reminders have been sent out, but the list has not been cleared. In the end of the day, the members who benefit from the network are those who attend, and hence the attendance number is more important than the number of registered members. However, during 2005 we have seen a drop, which currently creates discussion on how to revitalize the network, see Section 7 on Future work.

Working groups

The working groups have been formed temporarily among the network members. There is neither a complete documentation of the groups, nor of their results. Hence the list in Table 1 is to be seen as examples. The duration of a working group is

normally 4-12 months. Where longer time spans are denoted, it means that multiple working groups or other activities are run.

Table 1. Examples of working groups in SPIN-syd.

Topic	Year	Working group format	Results
Configuration Management	1997-1999	PhD student practice at one SPIN-syd company	Improved company CM practice Annual conference presentation
Component-based development	1997-1998	Product and consulting company joint effort	Basis for company strategic decision Annual conference presentation SPIN-syd technical report
Requirements engineering	1997	In depth analysis and improvement of requirements engineering process	Improved RE process Report on the study [Regnell98]
Benchmarking of software process	1998	Exchange between two non-competitive companies. Visits with presentations.	Personal experiences Internal reports Annual conference presentation
Extreme Programming	2001-2004	Workshop series that led to XP implementation in at least two SPIN-syd companies. One was later researched in depth.	Implemented XP projects Report on XP implementations [Karlström02][Lundh02] Case study on XP in stage-gate context [Karlström05,06]
Testing practices	2002	Workshop series with 11 companies on test practices	Publications of the survey [Andersson02][Runeson03]
Benchmarking software architecture	2001	PhD student lead exchange between two companies with formal moderated process.	Experience exchange Publication [Höst02]
Software product platforms	2003-2004	PhD student lead exchange involving 10 companies.	Experience exchange Publication [Nedstam04] Key contribution to PhD dissertation [Nedstam05]
Unit testing definitions and practices	2005	Focus group discussion at a network meeting with 12 companies followed by questionnaire to 7 additional.	Publication of the survey in IEEE Software [Runeson06]

In addition to the working groups performed in the SPIN-syd context, members of SPIN-syd have contributed to working groups of the national network, SPIN-Sweden in conjunction with the Swedish Engineering Industries. These working groups were run on a commercial basis. Working groups with SPIN-syd members cover topics of:

- Automated testing in daily build
- Distributed development and configuration management

Oral reports on these working groups' results have been given in network meetings, and the reports are made available on commercial conditions.

Annual conference

The annual conference was arranged from 1997-2001 with the intention of broadening the scope of SPIN-syd to new companies and a wider audience within the member companies, see Table 2. It has always been an industry-academical joint venture, which can be seen from the number of presentation in the table. The practical arrangements and the financial risk for or gain from the conferences were taken by one of the SPIN-syd member companies, which counted this as a marketing opportunity. As the network has no own budget, some partner must take this role.

In 2002, the first in a series of industry days was arranged by the new LUCAS center for applied software research, with very much the same audience as the SPIN-syd conference, although with a somewhat wider scope. Hence, the SPIN-syd conference was not organized any longer. In 2005, the conference series was started again, by a joint arrangement between SPIN-syd and LUCAS – "Software days" in Lund.

Table 2. List of annual conferences arranged by SPIN-syd.

Year	**Topic**	**Presentations**			**Attendants**
		Industry	Academia	Joint	
1997	How to get the theory into practice?	5	1	2	72
1998	How do others do?	4	1	2	98
1999	How to make software?	4	3	0	126
2000	How to become World Class – technology or stock market?	5	2	2	73
2001	Extreme Programming	1	0	3	150
2002-2004 LUCAS industry days					
2005	Software Days - Agile	5	12	0	110

The annual conferences are an opportunity for the network to be more visible and to link new nodes into the network.

7 Future work

How can a network based on only volunteers sustain? How can people be motivated to continue? As outlined above, the results from the 10+ years of activity are numerous. However, the decreasing attendance figures in the year 2005 make us revisit the purpose and the format on the network activities. Proposals that are under current discussion are:

- Liaison with related networks in the region. There is another network with more focus on information systems.
- New meeting formats? Some voices are raised in favor of evening meetings instead of afternoon meeting. Others propose more social events to build personal networks.
- We have tried to make the responsible authorities aware of the key role SPIN-syd plays in the regional innovation network, but this far without success. This might

be worth pushing for again, and possibly get some funding as an innovation network.

Independently of the outcome of the above mentioned issues, we will try to maintain the open and trustful atmosphere, mutual understanding and benefits for different parties, which we consider keys to the success this far of the SPIN-syd network.

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Outcomes from six years of Software Process Improvement Networking in Rio de Janeiro

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Abstract. The aim of this paper is to present the results of a six-year experience in organizing and maintaining a SPIN (Software Process Improvement Network) in Rio de Janeiro, Brazil. The paper presents data, extracted from a survey submitted to SPIN-Rio participants, about SPIN-Rio meetings and discusses the factors that have made it successful and active to date. It also discusses some impact indicators of SPIN-Rio activities in improving professionals, organizations and the local software market. Finally, the paper presents the objectives of a research project, which aims to provide alternatives to facilitate collaboration and knowledge management among professionals.

Keywords: social networks, software process improvement.

1 Motivation

SPIN-Rio is one of the most active software professionals networks in Brazil [1]. SPIN-Rio was conceived in 1999, following the SEI's model for software professionals' network [2]. Basically, it comprises the meeting organization aiming at discussing demanding software engineering themes by the local software market.

This paper presents data on SPIN-Rio meetings and discusses the factors that have made it successful and active until now. The paper also discusses the results obtained from a survey submitted to SPIN-Rio participants so as to identify a number of SPIN-Rio activity impact indicators in improving professionals, organizations and the local software market. This survey also points out issues that can be changed in order to continuously improve the SPIN-Rio model and its benefits.

2 Goals and objectives

SPIN-Rio was started through the interest of only four persons. This group comprised members from both academy and industry, interested in software improvement research and practice: this combination of viewpoints made SPIN-Rio a 'consensus building' element right from its start.

By the end of the 90's, we still had a very small number of organizations attempting to adopt the CMM or another software process quality framework in

Brazil, and the need for practical experience and discussion was immense. This group was able to understand what the discussion needs could be for the local software market, since industry members already had the experience of deploying CMM in a financial organization and academic members were able to outline special themes that could bring new insights to SPIN-Rio participants. Additionally, as SPIN-Rio had a strong relationship with the academy, participants felt from the beginning that it was a group that could freely criticize and discuss this theme, without any bias whatsoever.

SPIN-Rio's main target is any professional, both from industry and research, interested in software quality subjects, establishing what we can call a community of practice [5] on software process. SPIN-Rio main discussion list at Yahoogroups! (spinrio-noticias@yahoogroups.com.br) comprises 439 participants, a fact which makes us realize that this is the group size.

3 Methods and tools

SPIN-Rio's main objectives are discussion and dynamic networking. Discussion can only happen if we bring together people who have experience as well as those who have doubts. Networking can only happen if people meet somewhere, physically or virtually. Knowledge sharing can only happen if we have a person who knows about a subject and others interested in learning about it. Thus, the main element for promoting discussions within SPIN-Rio was organizing special meetings in which a specialist is invited to present a talk, with attendants being able to discuss about it. Another important point in our strategy is making meetings free of charge: knowledge and discussion must come forth for free.

To infuse dynamics to the group, it was decided that every meeting should take place at a different company/institution. SPIN-Rio participants then become the company's guests for that particular meeting, with professionals from the host company also allowed to participate in the meeting. SPIN-Rio meetings took place at private and government institutions, universities, software providers, and software consumers. This dynamics has proven to be suited to help us visit new organizations, to learn about infrastructure and to feel their culture. SPIN-Rio meetings are social encounters. We enjoy making people feel free, being open to discussions, meeting other people and having pleasant hours of learning, discussion, and networking.

4 Procedures and artifacts

SPIN-Rio meetings always bear the same structure: 1) a professional is invited to present a talk about a selected subject; 2) three/four other professionals also skilled in, or displaying great practice on the theme, are invited to make up a round table; 3) participants are free to ask questions both to the guest speaker and to the round table; 4) a 'coffee-end' or social interaction time is organized, so that after being aroused by ideas and discussions, people can talk, interact and network.

The meetings themes are planned and chosen by the organizing group. Again, since we have participants from both industry and the academy, we were able to chose

highly interesting themes for SPIN-Rio audience, following the market and research needs and expectations. The themes discussed so far are as follows: The Brazilian Quality Prize (PNQ), CMM, CMM and Project Management, experience in software process improvement, peer reviews, experience in deploying total quality programs, process assessment, metrics, software testing, project management, quality models and how to use them, outsourcing, MPS-BR (the Brazilian process quality model), writing good requirements, CMMI, how to migrate from CMM to CMMI, risk management, and the eSCM.

The SPIN-Rio web site [1] serves as a knowledge base for the meetings, recording participants' registration and presentation slides which are made available for SPIN-Rio members. Recently, we started to build meeting briefings/reports organizing the main issues discussed during the meeting in order to improve knowledge capture.

5 Characteristics and metrics for benchmarking

The metrics we have used to date for benchmarking SPIN-Rio activities are especially related to the level of participation in SPIN-Rio meetings. Since September 1999, SPIN-Rio has organized 22 meetings, having received a number of participants as detailed on the table below:

Table 1. Participation in SPIN-Rio meetings

Year	Number of meetings	Number of participants
1999	2	26
2000	5	178
2001	3	141
2002	2	94 (estimated)
2003	2	112
2004	3	215
2005	4	130
2006	1	30
participants x meeting		42

It is important to mention that participants in meetings displayed different origins, not being restricted to SPIN-Rio members registered in the discussion list. Often, professionals from the host organization joined the meeting with new participants always coming up. We have also attempted to quantify the different levels of participation from private and government industry organizations as well as from universities. Our records show that 25% of the participants came from government organizations, 56% came from private organizations and 19% came from universities.

5.1. Survey

We have performed a survey to identify and demonstrate the results obtained by SPIN-Rio during these years. This survey had as its main objective identifying SPIN-

Rio activity impact indicators in improving professionals, organizations and the local software market. Additionally, the survey attempted to point out issues for continuously improving SPIN-Rio model and activities. The main question we were striving to answer was how SPIN-Rio participants recognized the benefits of partaking in the group and in its activities and how SPIN-Rio was achieving its original objectives.

The main instrument for conducting the survey was an on-line questionnaire [3] made available to the group (a total of 439 persons registered in the discussion list). 42 participants answered the survey, comprising 10% of the group, a fact which leads us to understanding that these answers are representative. The results collected by the survey and some of the comments registered by SPIN-Rio members were as follows:

"The topics discussed in SPIN-Rio meetings are useful for the work you perform in your organization?"	Yes. The discussed topics have helped me to better understand my organization software processes.	64%
	Yes. The discussed topics have helped me to deploy my organization software processes.	28%
	Yes. I have been able to better participate/discuss my organization software processes.	42%
	Yes. In other ways	9,5%
	No. Knowing the topics discussed in SPIN-Rio makes no difference to my work.	-
"SPIN-Rio meetings have been useful to you individually?"	Yes. SPIN-Rio meetings have helped me to follow market tendencies.	76%
	Yes. SPIN-Rio meetings have motivated me to search for more information.	62%
	Yes. In other ways	7%
	No. SPIN-Rio meetings are not useful to me.	-

Answers to these two questions show us that one of the SPIN-Rio objectives – to increase knowledge about software engineering practices – is being achieved. The numbers are confirmed by some of the comments registered by respondents, such as: *"Many times we identify that the problems faced by organizations are similar." "There is not only theory, but practice." "After meetings, with the knowledge obtained, I attempt to apply improvements to our internal processes." "I do consulting. The topics addressed in SPIN have been useful to me to participate/discuss the software processes in the organizations in general." "While understanding the models and frameworks presented in the market, I feel more secure in giving opinions about process improvements and organizational change." "I think it is important to know how other organizations are defining their processes and to listen stories which I can tell in my organization. This is a kind of motivation to process deployment. "The meetings are a great opportunity for learning." "When I hear about a new and relevant topic in a meeting, I strive to study it more."*

"Do you consider SPIN-Rio as a group able to criticize and establish free opinions?"	Yes.	98%
	No.	2%

Answers to this question confirm our strategy of attempting to make SPIN-Rio a free forum for discussion. This perception from SPIN-Rio participants is strongly related to the gratuity for participation, as shown by the answers and comments given in other questions. One participant gave us the following comment: *"I believe that exemption is a general tendency, however it can vary, depending on the participants invited."* Of course those participants invited to make presentations and discussions

naturally promote their institutions and work and we believe that this is also part of the SPIN-Rio objective for networking. People need to know each other and their competencies.

"Do you use the network offered by SPIN-Rio?"	Yes. During the meetings I exchange information and experience with other participants	36%
	Yes. After the meetings, I keep in touch with some people to continue knowledge and experience exchange.	31%
	Yes. I have already established partnerships (commercial or otherwise) with organizations/participants that I meet at SPIN-Rio.	17%
	Yes. In other ways.	7%
	No.	33%

Common comments to this question were: *"I know many participants and in the meetings I always strengthen the relationship with those I already know."* Answers to this question give us the understanding that networking in SPIN-Rio occurs predominantly during meetings and that the possibilities for contact and working together are not clearly identified.

"Do you consider that the model of SPIN-Rio meetings is good for knowledge acquisition and networking?"	Perfectly adequate. There is nothing to change.	52%
	Very adequate. I have few improvement suggestions.	33%
	Adequate. It works, but I have improvement suggestions.	14%
	Reasonably adequate. I have many improvement suggestions.	-
	Definitively not adequate. It is necessary to change it completely.	-

Answers made us believe that participants are satisfied with SPIN-Rio meetings model but are willing to capture more knowledge and conduct deeper discussions: *"I would like to suggest longer meetings – an afternoon or even an entire day." "I propose events like short tutorials and workshops." "It would be good to increase interaction through the website, the discussion forum, etc."*

"Do you think that meetings should be paid? Why?"	No.	95%
	Yes.	5%

This issue provided us with interesting reflections. We always believed that free participation (including no financial aid from enterprises) would bring SPIN-Rio exemption, sense of community, and freedom for open discussions. This was confirmed by the answers obtained through the survey and by the following comments: *"Payment would restrict participation." "Payment would not stimulate new ideas." "We would have complaints from participants who paid and did not solve all their doubts during the meeting." "Gratuity motivates people to participate in meetings and to discuss topics that are not sufficiently addressed and organizations face great resistance." "Paying would restrict different sources of participation – professionals and students – with different views, experience and objectives." "The philosophy is of an open community."*

However, there is a feeling that some funding is necessary to enhance learning and interaction possibilities. Additionally, there is a growing feeling that participants are not usually committed to participating in every meeting. Maybe if they had to pay,

they would have a higher level of continuous participation. Some comments: *"Payment would decrease participation but would increase commitment and possibly bring participants from outside Rio de Janeiro." "A small fee could be paid in order to finance minimum costs and meetings would not depend on an host organization." "Maybe we could ask participants to bring donations."*

"Your participation is voluntary or mandatory by your organization/supervisor?"	Voluntary	100%
	Mandatory	-
"Do you believe that topics and discussions in SPIN-Rio meetings increased your knowledge?"	Definitely.	24%
	It increased extensively.	10%
	It increased.	64%
	No. It did not change.	2%

The above results showed us that participants feel satisfied and feel gains by participating in SPIN-Rio meetings. Additionally, these results confirm that SPIN-Rio is achieving its other objective of helping the local community to increase their knowledge about software engineering.

"What kind of benefits do you believe an organization will have by hosting a SPIN-Rio meeting?"	Participation of its professionals.	74%
	Making people know the organization.	71%
	Reaffirming the motivation for adopting software engineering practices.	62%
	Others.	2%
"How local market can benefit with groups like SPIN-Rio?"	Increasing the discussion on topics of interest.	74%
	Networking	64%
	Establishing actions and partnerships.	59%
	Increasing the knowledge on software engineering topics.	57%
	Others.	2%

These results show that SPIN-Rio is being perceived as bringing benefits for organizations, professionals and for the local market.

"What are the factors you believe that made SPIN-Rio successful through these 6 years?"	Importance of the topics addressed.	83%
	Participants' knowledge	71%
	Quality of the meeting organization.	54%
	Group exemption.	52%
	Frequency of meetings.	40%
	Number of participants.	19%
	Meeting proceedings.	16%
	Others (gratuity, the SPIN-Rio organization team)	7%

These last results show that the great importance assigned to SPIN-Rio activities comprises the knowledge it makes available.

6 Lessons learned

Performance: We can affirm that SPIN-Rio is a successful network, concerning the model on which it is based. Performance indicators are obtained from analyzing the number and diversity of professionals that were affected by meetings. SPIN-Rio

meetings reached a total of 926 professionals. Even if we understand that from this total, professionals may have participated in more than one meeting, this number represents high level amplitude of the network. Considering the participation on meetings (42 participants/meetings) and the percentage of participants from government, private and academic organizations, it can be understood that SPIN-Rio shows a good level of diversity, what enriches knowledge and discussion. Concerning the frequency of meetings, we had about 3 meetings/year. Some years have been more productive in organizing meetings than others and this is directly related to the organizers' time availability to organize them. Our actual rate has not reached yet the ideal target of having 4 meetings/year. This fact leads us to a strategy of making the group more collaborative/participative and not to depend on the organization board.

Success factors. These factors comprise both organizational factors as well as external and contextual factors. From the organizational point of view, we outline the model of SPIN-Rio meetings which includes: gratuity for participation, voluntary participation in meetings, the focus on updated and highly demanded software engineering themes, the possibility of having the presentations available in the SPIN-Rio site [1], and the interest in keeping discussions unbiased, among others. From the external or contextual point of view, we can argue that there has been great interest from the Brazilian Government in improving software development, including software products and service export. This has made software organizations and professionals believe that a great effort can be made in this area, bringing profits to software organizations and to the whole country economy. This feeling of opportunity brings a favorable context for networking and knowledge sharing within SPIN-Rio.

Challenges. Of course, there are challenges in keeping SPIN-Rio 'on the road'. First, all the organization work is voluntary and thus for free. People need to be highly committed to the idea of sharing knowledge and need to have this as a personal ideal. Second, despite the great interest of people in the meetings, it is not so easy to find many organizations/institutions who can promote open meetings. Third, we have to be highly critical in finding people and organizations that will not turn SPIN-Rio meetings into a place for marketing purposes. It is a place for discussion, not for selling things or services. Marketing is secondary and will come just from the fact of being there. We can say that, to date, we have been proud of providing high quality presentations and discussions to SPIN-Rio participants.

7 Future work

Rio de Janeiro is one of the most developed states in Brazil. Despite being one of the most densely-populated regions and one of the national economic centers, there is a growing sense that the software business in Rio has been facing continuous challenges. Great part of software clients have changed to other regions and software companies struggle to sign contracts with the few contractors that have remained, especially, gas, oil, telecommunications and government organizations.

The SPIN-Rio model has proven to be attractive to the local software community to meet, make contact, share information, expectations and doubts about practices and improvement initiatives. However, it has not leveraged the ability of this community to establish social or interest-based ties in order to articulate collaborative actions. Participants feel more as listeners in this community than as active participants.

In this context, we started a research project which aims at leveraging collaboration and knowledge sharing among SPIN-Rio members by adopting the social networks philosophy [4]. The objective of this research work is to build a social network called RCC-Sw which aims at mobilizing software organizations and professionals to perform actions in order to consolidate, strengthen and evolve the local software industry. A web-based environment was specified to support the RCC-Sw/Rio. The key characteristic of the proposed environment, considered as a differential from, for instance, mailing lists, newsgroups or communities of practice, is that it provides features for network members not only to interact but also to easily create and manage collective actions.

The concept of networks has been widely applied to the organization of philanthropic institutions, focused on social, political, health or ecological issues. These networks usually have broader objectives that comprise interests of the whole society. In RCC-Sw, although the network objective has to do with improving the local software market, we do believe that participants will come firstly to feel as being part of it, to have access to knowledge that can benefit them, and to find work and business opportunities. The great question this research work will attempt to answer is, can software professionals share and commit to a common objective?

We are working on the idea that the characteristics of a social network as mentioned before can help participants gradually feel differently and willing to collaborate. The concept and dynamics of social networks are believed to be the factors that will provide agents with commitment, collaboration, effective knowledge sharing, combination and, finally, learning.

Acknowledgments. This research work is sponsored by the Brazilian National Research Council (CNPq) under grant #506424/2004-9. The authors would like to thank all software professionals who answered our survey, SPIN-Rio organizers; and the other RCC-Sw project members.

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The Virtual Software Engineering Competence Network software-kompetenz.de

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Abstract: The virtual software engineering competence network "software-kompetenz.de" brings together software professionals from research and industry and provides access to a comprehensive pool of knowledge by means of technology descriptions and related experience. The targeted audiences are especially small and medium-sized companies (SME). As for many publicly funded research projects, the question regarding sustainability arises. How can the achievements, results, and services be kept alive? This paper describes alternatives to solve these issues and lists requirements for the long-term operation.

1 Introduction

The importance of Software Engineering increases as software is becoming an integral part of products in our daily lives. In many cases, software leads to a unique selling point and contributes to a main part of a product's added value [BrRo02]. A study performed on behalf of the German Federal Ministry of Education and Research clearly shows that in the future, occupying the technological leadership position in that area will be of central importance for industrialized nations [BrRo00]. Short innovation cycles and changing requirements for software require organizations to be highly flexible with regard to their internal development processes. Especially small and medium-sized ICT enterprises and those from the secondary industrial sector who embed software into other products and services have difficulties in coping with this speed. Only 20% of these organizations have collaborations with universities or public research organizations for acquiring innovative techniques.

In their manifest on the strategic importance of Software Engineering, German university professors demand improved networking between research and industry [BJNR05].

The situation of Germany's software industry is characterized by missing social networks between Software Engineering users and researchers. But even ICT professionals, especially those from SMEs, appear to have little networking among themselves. The German software engineering research landscape is characterized by distributed groups of excellent researchers, some of them with an international reputation. But also these are not networked very well, especially on the operative level; often, overlapping or similar topics are investigated without a direct exchange of experience. Exchange of knowledge and experience between research and industry, as well as between users and ICT professionals has to follow the cycle of innovation but shall not hinder an organization's day-to-day business. For SMEs, reduced resources yield additional difficulties,

e.g., for organizational learning processes. Keeping that in mind, the virtual software engineering competence network (available at www.software-kompetenz.de) aims at intensifying networking between ICT professionals and researchers in order to foster exchange of experience and mutual learning.
This paper is structured as follows. After discussing the underlying concept specific measures used to enact the competence network are described: Chapter 2 describes the development of the software engineering know-how and its structure and Chapter 3 describes the organizational processes that are necessary for guaranteeing a sustainable operation. Chapter 4 summarizes the paper.

2 Content and structure of software-kompetenz.de

At the beginning of the funded project, fundamental software engineering methods and techniques as well as empirically based experience were packaged and made easily accessible through the Web. Various requests from many different users of the virtual competence network require making the available knowledge as easily accessible as possible and structuring the content for different kinds of users. Therefore, the knowledge was characterized according to different criteria and stored in a database. Different kinds of access allow for attracting different user groups:

- Thematic structure according to the IEEE standard of the "Software-Engineering-Body of Knowledge" [SWEBOK]
- Application-specific access according to the industrial sector (e.g., automotive) and domains (e.g., eBusiness)
- Full-text search
- The whole content is available from search engines (URL for each content element)
- Distinction between topic, detail and link

The aim of representing processes, tools, artifacts, or experience with their specific characteristics through their own attributes had to be neglected due to the complexity of the data model. Authors of knowledge elements were unable to provide consistent contributions. Figure 1 shows the current version of the underlying data structure in UML notation.
In June 2006, more than 4000 contributions of more than 50 authors were stored in the database. For the realization of the platform, the content management platform WebGenesis [WebGen] was used as a basis, which has been extended with regard to the database scheme and the usage concepts. The content as provided by the platform is accessible through different entrances based on different views, e.g., according to SWEBOK (cf. Figure 2 left; orange colored area). A second link list (cf. Figure 2 left; right, blue colored area) is generated from the meta data stored in the knowledge base, e.g., literature references. In order to keep the user on track (to not lose him in the multitude of knowledge elements), it has been proven useful to encapsulate knowledge areas and provide fixed thematic entrances. Because of the complexity of the areas, repre-

sented through multidimensional links between them, a graphical representation has been evaluated. However, it cannot replace the normal hypertext links (see Figure 2 right).

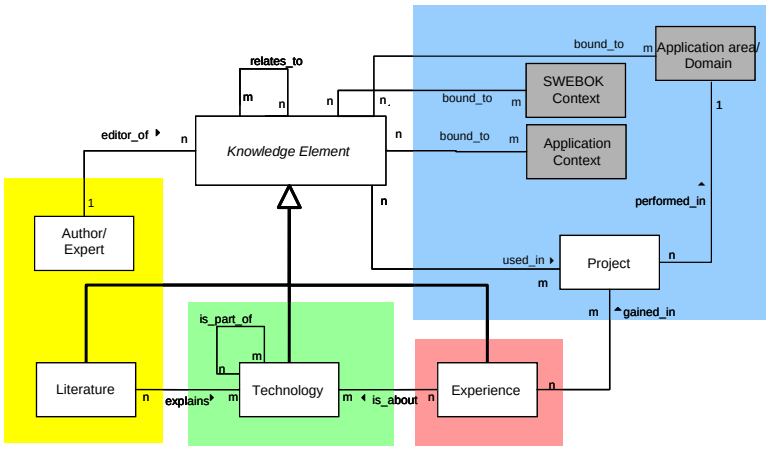

Figure 1: Model of the repository schema in UML-notation

A living community needs active participants, who contribute their articles to provide manifold, up-to-date, and attractive services for the intended user group. Therefore, the infrastructure allows (1) commenting on and evaluating articles, (2) posing questions in the forums, and (3) providing experience. The initial expectations with regard to the use of those tools were not met; though there is a positive trend in the overall visits to the portal, the active participation and contribution of people from outside the project does not meet the expectations.
According to an analysis of the visits in June 2006, only one out of 200 users visited the forum and less than 10 new articles/comments have been contributed. The search functionality was used by one out of 20 users. Based on repeated user surveys, the reason lies in the “consumer habit” of the visitors and the primary motivation for their visit, namely the acquisition of information. The writing of one’s own articles is often seen as too time consuming. Existing mechanisms for the publication of user experience are rarely used. There is a tendency for people to prefer publishing in journals or online in market leading forums, like Wikipedia [WikiP], or portals that place the competence of the author in the center of interest, like competence-site [CompS]. The aim of software-kompetenz.de was to be as neutral as possible and not to be a platform for the marketing of individual interests.

Overall, the services provided by software-kompetenz.de are considered to be “good”. Only the lack of user articles and articles from practice has been criticized, which is understandable, because the basis was built up by authors from research institutes.

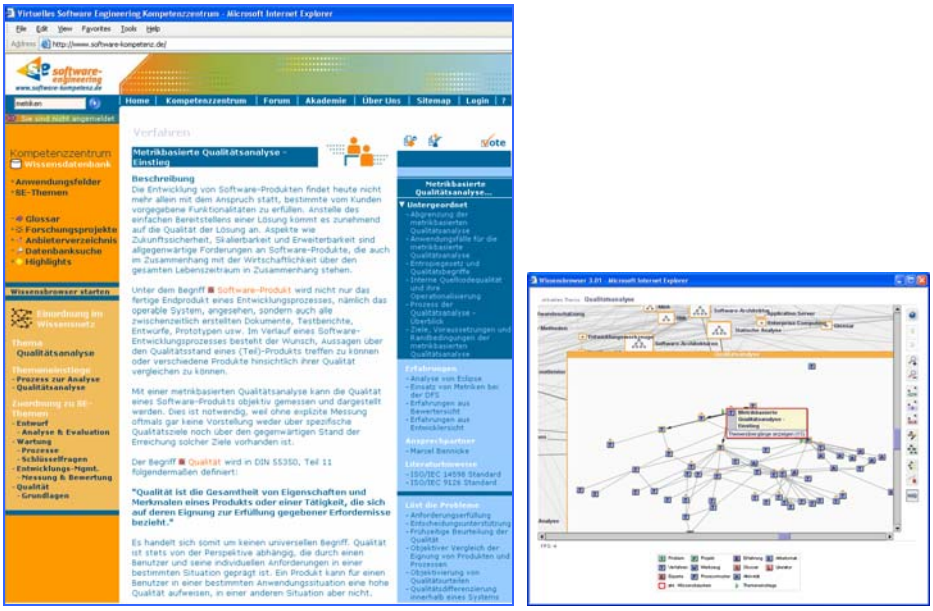

Figure 2: (left picture) Content from the knowledge base is displayed between the primary navigation (left) and a content related navigation (right). (right picture) The knowledge browser shows a 2D-visualization of linked content elements.

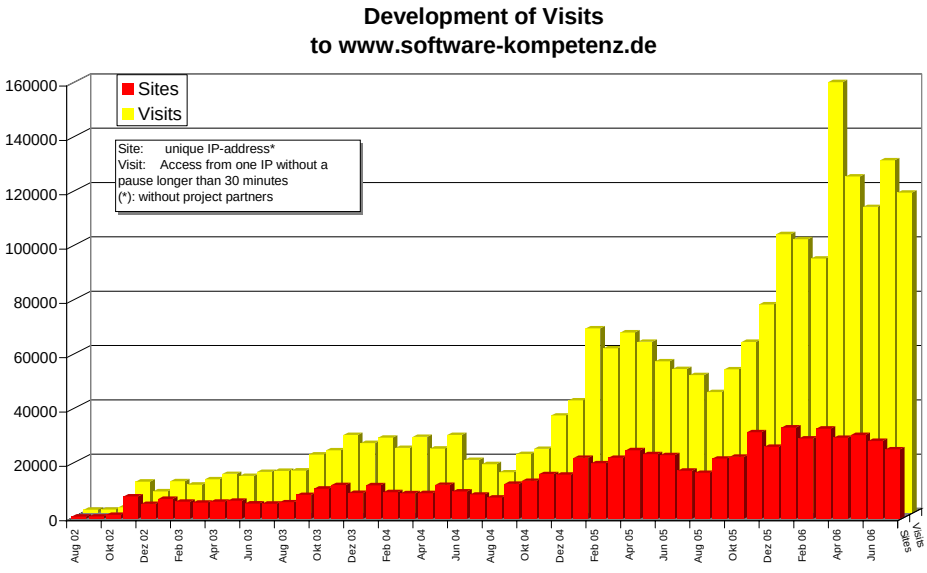

Figure 3 Development of visits to software-kompetenz.de

3 Organization and Continuous Operation

For many Internet portals that have been built up within public projects, continuing operation after funding has ended is an open question. For example, most of the 130 competence networks from the German competence network cluster initiative *kompetenznetze.de* depend on public funding [SRHH04]. Some portals are financed through sponsorships (e.g., logistics.de, or kompetenznetze.de), but others are only administered or die completely after funding runs out.
Up until now, the portal *software-kompetenz.de* has been financed through the publicly funded project VSEK. From 2007 onwards, a long-term operation without public funding shall be established. For the project, as for most similar initiatives, there are two alternatives: an honorary one and a commercial one, which we will discuss in this chapter.
Our main requirements were to continuously offer open content and independent operation in order to prevent contents from reflecting a single company's or school's opinion. The vision and spirit of the virtual competence center should be preserved. Because we knew that possible income would be minimal, the costs of the solution should also be as low as possible. The supporting organization encompasses: ensuring organizational operation, ensuring technical operations, and acquiring financial funds.

3.1 Requirements for Continuous Operation

The tasks for organizational operation can be divided into "contents" and "community". For maintenance of contents, editorial work has to be performed (newsletter, introductory texts), the process of quality assurance has to be controlled (e.g., fast feedback from reviewers), and up-to-dateness has to be monitored (e.g., functionality of links). The most difficult and challenging task is to further build up and take care of the community: attractiveness and quality of the offerings is highly bound to active authors, reviewers, and users, who care about current and interesting contents. Supporting the community requires, on one the hand, to win new users (through advertisements, search engine entries, or direct addressing). On the other hand, the offerings have to be kept attractive (good content, good visibility). Competition is high and new trends for knowledge communities (e.g., RSS-feeds, blogs) have to be investigated and implemented, if necessary. Unique selling points of software-kompetenz.de are the review process and the highly networked content. Within the project VSEK, project partners have also been organizing local events, such as workshops and presentations. In order to build up confidence, face-to-face meetings are very helpful [HoWu03]. In addition to operational tasks, a strategic steering committee that defines and controls goals and actions is necessary in our opinion to comply with the mission and vision of the project.
Technical operation encompasses maintenance of the web-server, the content-management system, and the underlying database. This requires server hardware, Internet access, software updates for operating system and tools, as well as maintenance of layout templates and CMS structures.
From our experience, acquiring financial funds for non-commercial Internet portals is very hard. Online advertisements will not cover all personnel costs (even with 100,000 visits per month), but is easy to organize with services such as Google AdSense™.

HW/SW sponsors are hard to find – there are just too many portals out there, looking for support. Selling content is also difficult, since other portals such as Wikipedia offer free access to often similar resources. Last but not least, membership fees are one option, if communities can receive added-value services in the closed community. However, the critical mass is high (we would estimate 1,000 members) and added-value service requires unique services and business models (such as OpenBC).

3.2 Modes of Operation

The decision between voluntary and commercial operation for software-kompetenz.de was determined by the estimated effort and the question of whether this effort can be achieved through voluntary work. The second question, of course, was whether enough funds could be raised in case a commercial option should be chosen.
In the commercial option, organizational and technical operation are completely covered by one organization. The approach of founding a new company would raise large personnel costs and was therefore excluded. There are service companies that do offer portal maintenance at much lower costs. This option has been evaluated, but with the requirement to set the overall strategy (and limit influence/risk management of the executing organization) the remaining costs are as high as about 75,000 EUR (including possible income from advertisements).
In the voluntary operation option, organization and technical operation are mainly organized through voluntary work of individuals. Income from advertisements or partnership programs (e.g., for books) is used to co-finance technical operation. It is beneficial if an existing not-for-profit organization or community can be found to support or host the activities. However, the voluntary option has the big disadvantage that it relies on people's willingness to contribute. In addition, if a not-for profit organization is founded to deal with the community, government laws mostly prevent income from advertisements or partnership programs.
For software-kompetenz.de, both possibilities were investigated. We finally came up with a mixed solution: technical and organizational operation are given to a commercial organization, which can use the portal to advertise its own complementary services and contents. It receives all income from advertisements or partnership programs. A large computer science not-for-profit organisation will take patronage; their working groups will take responsibility for software engineering topics and act as reviewer. A new working group for the portal activity will be set up to advise the operating company. This solution is currently being negotiated with partners. The disadvantages and risks of a more complicated set-up and possible lack of industry involvement are things that we are willing to accept, since no better solution could be found.

4 Summary

The goal of the virtual software-engineering competence network *software-kompetenz.de* is to support experience exchange between research and industry. Cooperation should

foster the competitiveness of German companies in software engineering. Especially small and medium-sized companies (SMEs) are addressed by the project, since they do not have their own resources for research and technology evaluation.
The functionality of the portal enables SMEs to contact and cooperate with scientists and other practitioners. Our experience shows that most users rather consume the offered contents than provide their own articles and comments. Success stories for professional articles such as Wikipedia [WikiP] or Math Forum [MathF] are singularities – most experience bases, wikis or weblogs for these contents have only few users and communities. Nevertheless, software-kompetenz.de shows more than 100,000 monthly visits after four years of operation.
The professional focus and idea of the portal, to bring together research and industry in a joint virtual competence network, is unique. Most similar sites do not address industry, such as the Center for Empirically-based Software Engineering [CeBASE] or the European Esernet project [Esernet]. Both examples also show that information sources of this kind can only be built up using public resources.
The network was started in fall of 2002 and built up with public money from the German government. From 2007 onwards, it shall operate without external support. Therefore, a business model was needed that would enable long-term operation. After analysis of the alternatives, a mixed model was chosen with contact office and technical operation being in the hands of a commercial business, and operation of contents and the community in the hands of an existing not-for-profit organization.

Aknowledgements

Planning and build-up of the software engineering competence center software-kompetenz.de was funded by the German Ministry of Education and Research (project no. 01 IS C39).

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Regional Exchange of Knowledge between ICT Professionals from Industry and Research: The social differentiation of interests and practices in the theory of Pierre Bourdieu

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Abstract. A case study presents a regional network analyzed using Bourdieu´s Social Capital concept. This analysis shows prerequisites of knowledge exchange processes in successful networks, such as reciprocity between different stakeholders. Using the theory of Bourdieu, reciprocity and other important factors may be analyzed against the background of the actors' daily work practice. Therefore, Bourdieu´s theory is presented as a valuable tool for the analysis of regional networks.

Keywords: Regional Networks, Social Capital, Pierre Bourdieu, Forms of Capital

1 Introduction

The necessity to tackle a changing world makes learning an issue of mayor social and economic importance. In this context, the use of ICT and regional clusters has often been advocated to promote the development of hi-tech regions and branches. However, often problems arise due to a missing capacity to share and use knowledge [1]. A profound understanding of these problems is a prerequisite for anybody trying to solve or avoid them.

In this paper, Pierre Bourdieu´s concept of Social Capital is presented, as it allows the understanding of knowledge as an economic resource, and the dilemma of a related individual "investor", as well. In our case study we explain how Bourdieu´s differentiation between forms of capital allows a more profound analysis of knowledge sharing and related promotion activities. Subject to our field study is a regional network in the context of the VSEK project, which also established the internet portal www.software-kompetenz.de. The network is one of various regional events installed in different German regions as socio-technical measures for knowledge exchange in the field of Software Engineering

The paper starts with Bourdieu´s Social-Capital concept and a brief overview over its role among other forms of capital. Subsequently, we describe the research that we conducted on the theoretical basis of a social capital analysis, and our related findings,

which we discuss in the following. The conclusion reflects the impact of our research results for the analysis and promotion of networking and knowledge transfer.

2 Regional knowledge exchange

2.1 Regional Networks and Social Capital

Since quite a while, regions have been described as an important frame for economic development and related learning and promotion activities. As a result, business development institutions on a regional, but also national and international level have adopted a number of related programs. On a theoretical level, references in this regard can be, among others, the concept of "flexible specialization" of Piore and Sabel [2], the cluster concept of Porter [3] [4], the "innovative milieus" of Maillat [5] or the "learning regions" of Lawson and Lorenz [6].

In practice, the promotion of regional networks has not always been successful, which led to the question of how to evaluate them. Some related efforts were directed to an analysis of general factors of importance in order to improve related consultancy (see, e.g., Scholl & Wurzel [7]), while others attempted to investigate into the particularities of individual promotion activities (see, e.g., Trier et al. [8]).

However, only few authors abandoned the point of view of the promoter and focused on the individuals and their motivation and hesitation to share and use knowledge [9] as a prerequisite for sustainable networks. One of them was Pierre Bourdieu, whose concept of Social Capital has been de-contextualized, reinterpreted and popularized, among other, by Robert Putnam [10]. However, it makes sense to trace back Social Capital to Bourdieu, as his original concept presented it as one form of capital among others and thus allowed to understand related "investment" problems in general, and prerequisites of regional networks in particular.

2.2 Bourdieu´s view upon Social Capital as one among other forms of capital

Coined at the beginning of the 20th century, the concept of Social Capital has been theoretically funded by Pierre Bourdieu [11] only in the Eighties. Since his approach starts with actors being engaged in a struggle for their interests [12], his concepts allow for an analysis on interests and negotiation strategies in the conflictive relations of networks. Emphasised by Jean Lave [13], this relational view upon situated interaction sees uniformity of knowledge or belief of a set of people more as an exception than a rule.

In related competitive environments, Social Capital requires investment in social connections, which can be re-transferred into economic capital. In this understanding, Social Capital is "the aggregate of the actual and potential resources which are linked to possession of a durable network of more or less institutionalised relationships of

mutual acquaintance and recognition" [14]. The access to specific durable connections can open the doors to important resources.
Bourdieu describes Social Capital in the context of other forms of capital, i.e. cultural, economic, and symbolical capital. Economic capital is directly convertible into money and institutionalizable in property rights. Cultural capital (embodied in valuated habits of an individual person, institutionalized as qualifications or academic credentials, or objectified in cultural goods) thus is convertible only under certain conditions. Symbolic capital is a means to represent a privileged status.

3.1 Sample: The Usability Network

Subject to our field study was a regional network in the Rhineland/ Germany, established between professionals from research and industry in the field of Usability. The first initiative to establish a regional network came up in the context of the national German VSEK Project. In 2002, three researchers from a research institute in the Rhineland, involved in the VSEK project, came up with the idea to promote the knowledge exchange between research and local firms in the field of *usability engineering*. Up to the time of our research in 2004/2005, these three researchers belonged to the managing committee of the network. Additionally, two managers of local small enterprises were recruited for the committee. The main activity of the managing committee was the organization of evening events some four times a year. This included the tasks to find an interesting lecturer of the field of *usability engineering*, to organize the locality, including drinks and snacks, and to invite interested professionals of the local software branch. The location was a historical castle on the campus of the research institute. Generally, the events were launched by an introductory lecture on a specific usability topic by a prominent guest from industry or research. After the lecture there was space for a short discussion on the lecture, before going on to the more informal part of the event. Eventually, *prosecco* and canapés were served and the participants were encouraged to talk and network with each other. Previous to the first event in 2002, the organizers sent 500 invitations to potentially interested regional actors from industry. The respective addresses have been obtained from the local chamber of commerce. About 40 people took part in the first event, and in the following events the number varied between 15 and 30 persons.

3.2 Research Methods

To examine the knowledge exchange in the usability network, we collected different kinds of data and used different methods. Main data were 20 interviews with organizers and participants of the usability network events. Most participants were entrepreneurs and (in a smaller share) employees of small and medium enterprises (SME), as this was the target group of the VSEK project and the focus at the beginning. Additionally, few employees of big companies, one agent of the regional business development and one official of a local agency were interviewed.

The research method used to analyze the usability network was strongly based to the "*paradigmatic model*" in *Grounded Theory* according to Strauss and Corbin [15], which was combined to a classical interview-based hypotheses-testing procedure.

A semi-structured questionnaire was set up intended to motivate a strong influence of the persons interviewed. Interviewees' emphasis diverging from the hypotheses was strongly accepted. Starting from document analysis (member lists etc.) the interviews were organized, executed and recorded (if permitted). The interviews were transcribed in paraphrases, conserving argumentation and articulation patterns.

4 Findings

The relationships between the participants and the organizers may be classified as (1) acquaintances of the three organizers of the research institute and as (2) persons who did not know the organizers personally, but were interested by the invitation. Anyway, most of them knew the research institute and thus, came with specific and different expectations regarding knowledge and contact acquisition. Two of the researchers led the usability department (in the following ORG US1 and ORG US2) and worked in the research group headed by the third researcher (ORG RE). Most participants acquainted with the researchers knew him, as he had worked in the region since many years. The two other organizers from SME were friends with the usability professionals. The five organizers together had constituted the association.

As one could assume, there were various motivations and expectations among the organizers regarding their engagement for the network. First, members of the VSEK project were interested to build up a regional network to contribute to the project efforts to promote software engineering. Second, since a *usability department* was built up only recently in the research institute, the engagement of some of its members for the regional network was conceived by them as a chance to get more visible both to the institute as to regional industry. Third, nearly all actors in the managing committee committed that they were "*networkers*", loved to meet new people as well as old friends, and talk. Fourth, for some, the network events were a good option to stay in touch with people. Fifth, an important reason for some of the committee members was to push *usability engineering* as such, as they perceived the situation of professionalization in this field as highly problematic. Sixth, the members from industry were interested to be integrated in possible future project applications or similar activities of the committee colleagues from the research institute.

Expectations and motivations also differed on the participants' side. For the analysis of such various attitudes, Bourdieu's concept of the forms of capital is extremely helpful. It not only allows to identify a status quo, i.e. positive and also problematic outcomes of the network process, but also to identify obstacles to sustainability and related improvement opportunities. In the following chapter, the three main capital classifications are used to describe the data collected.

4.1 Economic Capital

Due to the plurality of network events in the region, and especially due to the scarce time, for entrepreneurs of SME it is of particular importance that the participation is directly combined to a potential value: *"Only hanging around at a kind of development association doesn't much matter. It doesn't pay; there must be a business outcome!"* Overall, the expectation of a benefit as an outcome of the participation in the usability network or of the attendance at the events is closely connected to the evaluation of the research institute as an information provider.
Another expectation of participants was to learn something about the usability topic directly transformable in the daily practice and thus not "too academic": *"They* [the organizers from the research institute] *should explain how to use the usability engineering stuff in practice. I think there is a huge interest for that by all participants."* The two usability specialists (ORG US 1, 2) saw themselves as service providers. However, their daily job was to sell their services to big companies. Thus, they were not willing to give their knowledge away "for nothing":

"I understand that what we provide sometimes appears too academic and that people expect some knowledge that the can sell directly after. But then I sell it myself! We cannot deliver business ideas."

From the usability professional's point of view there was another problem with marketing issues at the events: As their clients generally were big companies that were willing and able to spend money on usability services, they could not build up reciprocal relationships to the participants of SME in an economic capital stance, as the SME usually did not have the financial resources to pay usability consultancy. The orientation towards SME, therefore, was not uniform in the managing committee: the usability professionals' interests and needs contrasted with those of the third researcher of the institute (RE), who was no usability professional, but had a research interest in examining and supporting the daily practice of SME of the software branch. From this point of view, he rather tracked a long term goal - and not the quick economic benefit the usability department was looking for - and the other entrepreneurs, too. But on the other hand, he was the work group leader of the usability professionals, and as such, dependent on the success of the usability center.

4.2 Cultural Capital

„You get an impression which words you have to use". This quote was uttered by a manager of a SME who was acquainted with one of the researchers (RE). They had worked together at a local university. This former collaboration provided a kind of shared cultural capital facilitating knowledge exchange. By means of his former practice, the manager was able to classify the information provided better than he would have without this experience.

There were similar statements from other participants knowing RE or other researchers of the institute very well. Cultural capital by means of a former *collaboration* also supported knowledge exchange in the organisers (RE) point of view: *„With my former graduate students, there is still a common practice. With them*

it is easy to strike up a conversation, and if it is sometimes about personal or private issues. "

The SME entrepreneurs, who only had more peripheral contact to researchers of the institute, held very different opinions on the benefit of the participation at the events. They criticised the kind of presentation in form of academic speeches: *"The events should rather be workshops than lectures"*. *„The knowledge is too academic. What people interests, is not research knowledge, but knowledge applicable to our practice. But the researchers are not interested in that"*.

In this context, there was an interesting controversy concerning the significance of the topic of the lecture. On the one hand there were managers of SME who preferred more orientation to practice and for whom the topic of the lecture was an important attractor. On the other hand, there was the opinion of the researcher (RE), who estimated the topic to be rather unimportant: *„What is really important to many people is the idea of building up a network. For that reason, the reputation of the managing people is extremely important, the people, who bring other people together"*.

Reputation seems to be another issue of discrepancy in the fields of small business and academia: As shown in the former chapter, entrepreneurs from SME must see an economic benefit in their participation in networks. They choose events very carefully from a mass of events of a region: *„I cannot sit every night in another network event. There must be some financial outcome, because I have to live by that"*. In contrast, to the researcher (RE) participation at suchlike events meant a well-known academic work pattern. To researchers, it is every-day practice to attend at lectures and speeches, even when there is no short-term economical benefit. The scientific knowledge exchange serves the accumulation of reputation above all.

As in terms of economic capital, it was also hard in some aspects to achieve reciprocity between SME and the researchers in terms of cultural capital: *„We cannot learn anything from the participants, because we are the professionals on the usability field"* (ORG US2). Setting actual work practices of SME participants into the centre of the events was considered to be absolutely uninteresting to some committee members. In contrast, the SME participants wished to hear problem solving strategies on the level of daily work practice, best of all, presented by successful SME. But nearly none of the SME participants was prepared to hold a speech on problems for reasons of the image of the firm. Some of them said to be prepared to give such a speech in a more workshop-like and trustful environment. A proposal of a SME entrepreneur was to hold a speech on the special products and services of the own firms to aim at possible collaboration and partnerships. But such a more commercial orientation of the network and the events was not desired by the research organisers. In contrast, the managing-committee members from industry would embrace this shift of direction. But as they were not the leaders in the committee, they did not have enough power to change things.

4.3 Social Capital

In his conception of Social Capital, Bourdieu states that an individual must possess a certain talent for building up and maintaining relationships. This requires being aware

of genealogic correlations. Regarding the researcher (RE), one can see that he possessed these particular abilities and that he could apply them to enlarge his knowledge: *„I was interested in the relationship between him* [one of the SME entrepreneurs in the managing-committee] *and the people of [big company] he brought along to one event. I could evaluate their relationship. That was very interesting for me"*. By means of his central position in the network he had a certain previous knowledge that could be enlarged on the events. In this special case, he got a better estimation concerning the competencies of his external committee colleagues for optional further collaboration. In contrast, external participants often did not know much about the organisation structure of the network or events: *„When I went to the event, I didn't even know anything about the organisers. I thought that this was an event promoted by the research institute"*. Another participant tried to get information about the network via internet, but at the time of the data collection, the network had no homepage. He criticized that *„you don't find any information about the network. You don't know anything about their goals and how one can get a network member"*.

In Bourdieu's conception, the accumulation of Social Capital may need a lot of time and other resources. In the given case, it required participation in the events, at least. As the frequency of the events varied from two to four times a year, the network was not present in the former participants' heads over a longer period. All members of the managing committee contented that they would appreciate a frequency of every two month. But as the engagement for the network had to be accomplished besides the every day work, they asserted that they were not able to spend more time for the network.

Another point regarding the investment of the time resource was the intended creation of a formal constitution allowing people to become members of the network. Two committee members favoured this, one of the usability professionals and one of his friends, a SME entrepreneur. At the time of the data collection it was two years since they had proposed to elaborate a constitution. Both justified the delay with a lack of time. However, this could also be interpreted as a closing mechanism of the managing committee: on one hand, the network activities were promoted as a public association since a couple of years. On the other hand, no external person was able to become member of the association.

5 Conclusion

Many interviewees, organisers and participants declared the network events useful in regard of knowledge acquisition or interesting contacts. On the other hand, the organisers benefited strongly in relation to social capital, while the peripheral participants were excluded from similar gains.

Another problem related to organiser (RE), who was strongly interested in persons from SME as a result of his research interests and of his interest in the networking process. But his reflexivity on respective problems did not enlarge his capacity to act, as he was bounded by the dependency on his institute colleagues. In this regard, he was in the dilemma to permanently choose between economic and Social Capital.

For Bourdieu, networks are related to (unequal) power structures, the existence of which thus is no counter-indication against the sustainability of a network. However, in the given case, peripheral persons did not only benefit less from the network, but additionally had little opportunity to change their peripheral role. This frustrated them and prevented them from perceiving the network as one of reciprocal relations. Reciprocity at all levels of capital thus was a problem, connected to the perception of each other and aggravated by a mutual disavowal of scientific knowledge and the situated expertise of SME participants.

The network process would surely benefit from opening up the inner circle by a formal registration of the association and efforts to make structures more transparent and to integrate externals in the organisation of the events. To maintain the central organisers' motivation, additional larger firms, regional development departments and agencies could be attracted, which could be of benefit for the SME, too. We passed such recommendations to the network organisers, who were very interested. Up to now measures such as improved information for the public about the network (a website) and the formal registration of the association have been taken. Further steps are in discussion.

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Document Information

Title:	Software Engineering Networking Experience
Date:	October 11, 2006
Report:	IESE-138.06/E
Status:	Final
Distribution:	Public