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Sharing Tacit Knowledge among the Laboratory Technicians and Academic Knowledge Workers - Barriers in Knowledge Sharing

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The research, my work and organisation

As part time researcher for PhD thesis 2005-2006

Creating knowledge in an expertise organisation - CRIO

Funding 2005: The Academy of Finland

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Turku Polytechnic
(Turku University of Applied Sciences)
Turku, Finland

The biggest polytechnic in Finland: 8000 students

High interest in international R&D projects 2006 and in the 7th frame programme of EU

Topics: wireless technology, mobile tv, e-learning, ICT in health sector, KM, content services…

Programmes as IST, eContent Plus, eTen, Regions of knowledge, Marie Curie etc.

Partners are welcome!

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Creating knowledge in an expertise organisation - CRIO

The purpose is
to gain understanding about the knowledge creation and sharing in the expertise work.

Case: the international pharmaceutical company

The present phase of the research:
analysis and writing

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University of Oulu
Prof. Reijo Savolainen, University of Tampere

The research question

The research question is threefold:

1 What kinds of procedures and communicative actions the experts apply in their information/knowledge sharing?

2 How different professional contexts or subcultures influence into the knowledge creation and sharing?

3 What kinds of barriers can be identified in the process of collaborative sharing and renewing of the knowledge in information intensive community?

Research data

The research data has been collected by using semi-structured enquiry by e-mail, which has been further completed by group interviews. The methods of classical contents analysis are applied.

Interviews via e-mail in the company cover 24 informants, as follows:

(a) 10 laboratory technicians (vocational education),

(b) 14 professional experts (most of them have a higher education degree). Themes of the inquiry and the group interviews were based on the SECI model.

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Detailed themes of the inquiry :

1. Orientation and joining the working community
2. Written descriptions of the daily work, routines and unexpected things
3. Successful experiences: getting recognition
4. Failures and consequences: the use of lessons learned
6. Collaboration and mutual support: internal network
7. Mutual learning in the work: ways to get information
8. Interaction and communication of the experiences: evaluating the use and effience of organisation's different meetings, e-mails, team work, external network etc. in information sharing
9. The importance of the work.

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The theoretical background

The epistemological framework of the study is based on the pragmatist philosophy of John Dewey.

His main idea is to combine human thinking and knowing with the processes of human action.

According to Dewey, the main tradition has drawn restricting lines on the one hand between knowing and action and on the other hand between theory and practise.

So called third generation of knowledge management should also emphasize the link between knowing, knowledge creation and action.

Knowledge sharing and creation = adding value to the previous knowledge

From the value-added point of view it can be defined generally:

Knowledge creation is a gradual process of adding value to previous knowledge through innovation.

Al-Hawamdeh 2003, 1.

Lot of interactions: the model

The knowledge creation activities are results of people interacting with the object,
people interacting with people,
people interacting with data and information,
people interacting with systems and
people interacting with the environment in which they operate, i.e. in a certain context.

(Modified by the author from the definitions of Al-Hawamdeh with additions of Yrjö Engeström's activity theory)

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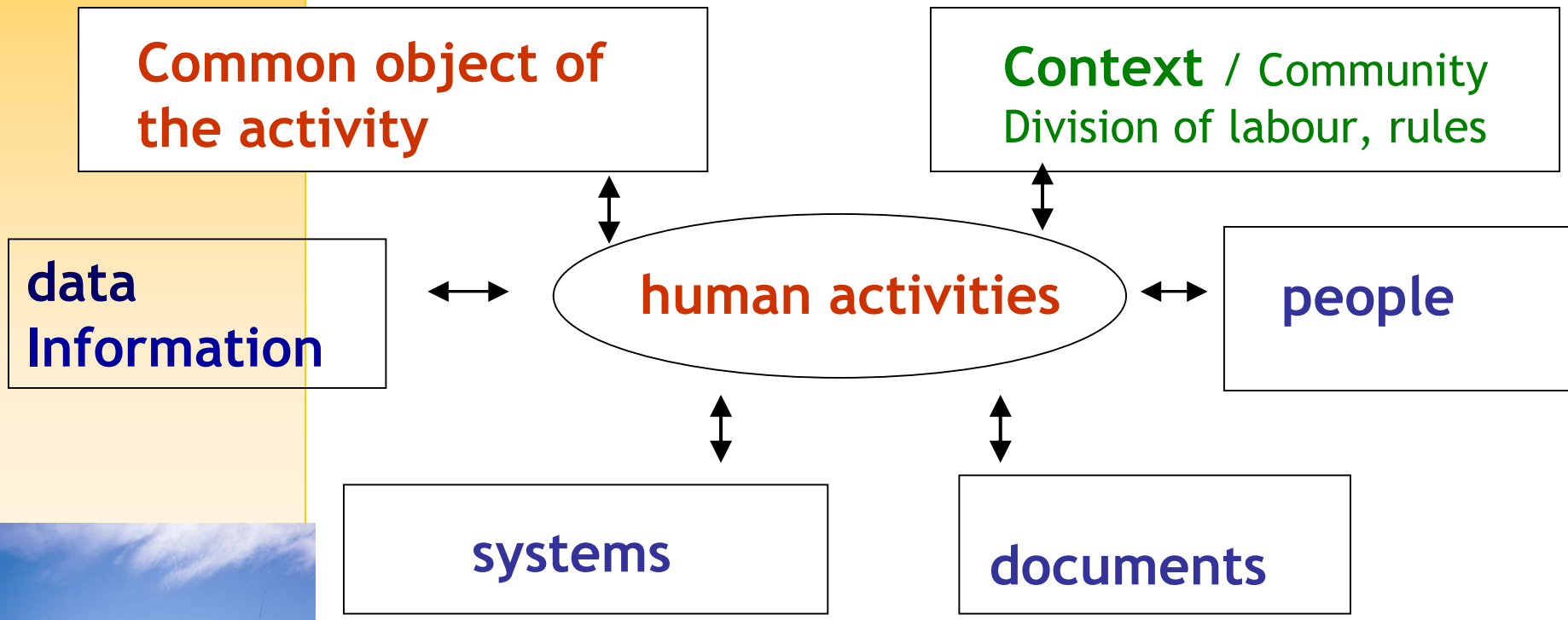
A Model of knowledge creation and sharing environment



the action-centered interaction between resources (tools) and activities in context

SECI-model as a base of inquiry

The data collection designed with theoretical framework of SECI model by Nonaka and Takeuchi (1995).

There in the model is the core of the knowledge creation in the conversion from tacit knowledge to explicit knowledge. The “know how" can be captured and documented (codifing strategy).

Criticism: It would be more correct to speak about implicit knowledge, not tacit. According to Polanyi: explicit and tacit are two distinct forms of knowledge (not variants).

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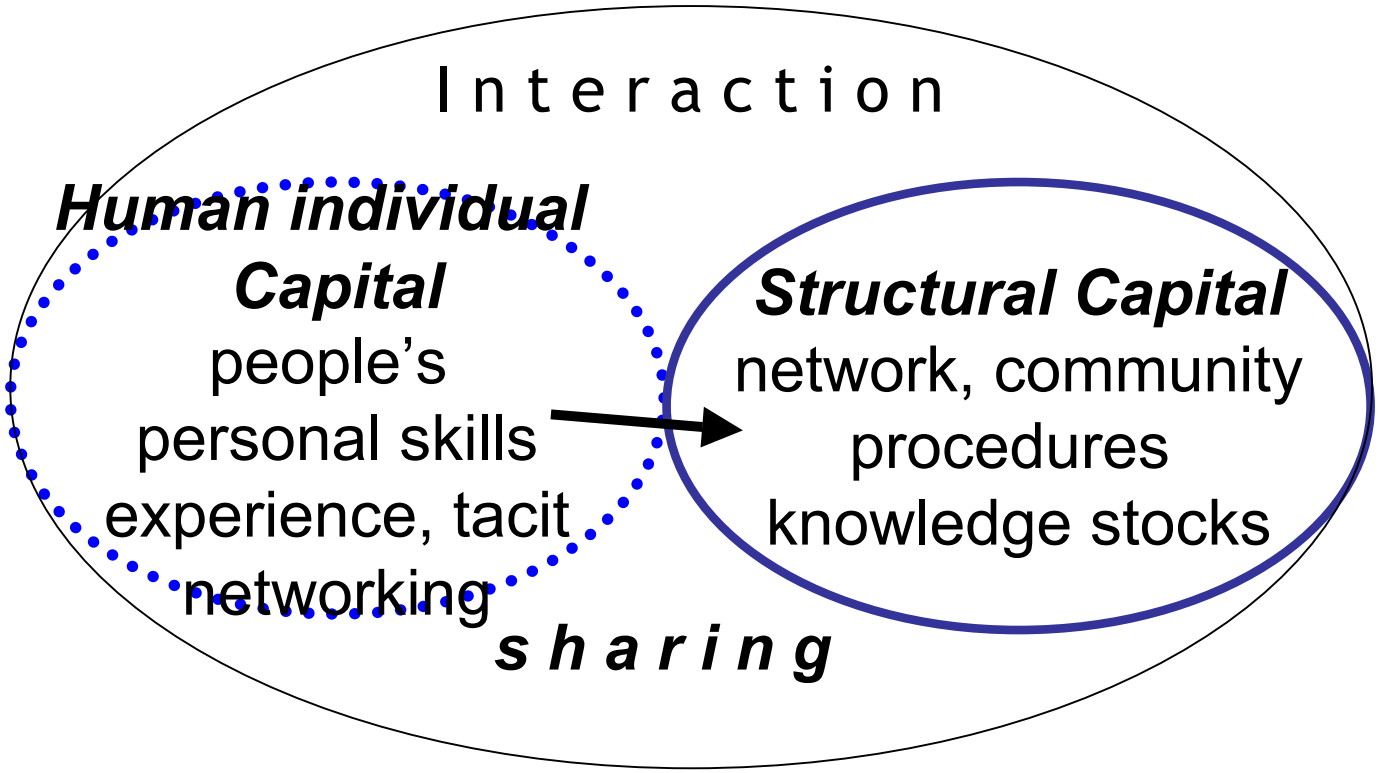
The Flow of the Intellectual Capital / SECI



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Two other theories on knowlege creation (used in the analysis)

It can be distinguished two interesting theories or models of knowledge creation, and two types of expertise to be involved there:

1.participation perspective (communities of practice)
-> the routine expertise

2.innovative knowledge communities
-> adaptive or dynamic expertise.

All these models consider social interaction, cooperation and communication with different people as crucial prerequisites for creating new knowledge.

(About the models and knowledge communities the look at visionary studies of Kai Hakkarainen, University of Helsinki).

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Observations from the study in knowledge creation and sharing

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From craft work to collaboration
Historical forms of the work

Victor and Boynton (1998) have described the historical forms or typology of the work and there is relationship with information and knowledge.

The first work was *craft work* where the low documented experience and non explicitable tacit knowledge were essential. The history goes by the development process of working through the phase of *mass production* in the industrial revolution to the modern organisations which demand *collaboration* in the work actions. People work today in the networking organisations where it is important to collaborate beyond over the borders of the departments and organisations.
The information and knowledge is generated in the collaborative dialogic work of different professionals.

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Two forms and cultures of production observed

In the laboratory technicians work is dominated by the practical craft work in addition to the mass production with the emphasize of information on the production process.

Whereas, in the academic professionals' work was a high emphasize in the wide external and internal change of information and knowledge sharing.

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Two forms and cultures of production

The laboratory technicians' work is very regulated, documented and tight controlled as its character. They are working as members in the research teams of 4-10 people consisting academic researcher such as chemists and doctors.

The information and new ideas were moving on via mutual communication but the flow of the information, the new formulation of the information added with the personal experience and knowledge and the implanting via socialisation process take in place in the everyday work. External dissemination of ideas is very poor.
The laboratory technicians e.g. do not use e-mails and they are not interested in sharing their ideas in the formal meetings. They feel the meetings' role as information and control. They share their experience specially in their internal professional restricted teams and groups.

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Nine barriers in knowledge sharing

1. hectic work
2. too busy in newcomer's orientation
3. difficulties in asking help if you are new or been off for a long time (lack trust/self confidence)
4. difficulties in making questions or suggestions in meetings (laboratory technicians)
5. laboratory technicians were only recievers of the e-mails, not senders
6. problems of the credibility, by the researchers
7. common subculture? -success among the equals allowed but not wished to be mentioned outside of the group
8. Intranet and internal document database not in use by laboratory technicians
9. no external networking outside of the unit

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Two stories on the question of trust and legitimation

1. Well remembered disappointment: the company's management did not inform about the essential changes in the company (over ten years ago); by many participants mentioned -> damages trust

2. The legitimation of ideas and innovations :
the experienced researchers of project group changed to another positions and the newcomers, new young researchers did not listen on the ideas of the experienced laboratory technicians -> missleding analyses for a long time

- missing trust and recognition of the skills and thinking of the laboratory technicians

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Academic workers - well networked

The academic workers' work is very networked and full of communication as its character.

Every working day is started by reading and answering e-mails, which often changes the schedule of the day. The main information sources are internal but also external colleagues and partners, private and official organisations. There are strict orders and national and international law which need to consider but on the other hand the work gives opportunities to plan and develop actions depending of the individual competences and skills. On this part the academic professional's work seemed very different than the laboratory worker's work.

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Personal face to face interaction and recognition make success

Two things were common for the both groups:
1. face to face discussions
2. the importance of the support and recognition of the closest foremen (managers) in sharing and developing innovations and knowledge.

The academic professionals considered that the meetings offer good opportunities to discuss about the new solutions and share knowledge. The face to face meetings considered necessary in addition to collaborate via e-mails, telephone and video conferences.

Two types of expertise

The data indicates that we can differ two types of expertise distinguished by Hatano & Iganaki (1991): (1) the routine expertise and (2) the dynamic and adaptive expertise.

The routine expertise means capacity of quick and accurate solving of familiar problems. However, there is not seen as much capacities of dealing with novel types of problems. The theoretical model would be, as mentioned, communities of practice.

The laboratory technicians work actions are tightly controlled, planned and foreseen, where many members of the technicians have the similar tasks.

Two types of expertise

The **second** type of expertise is called adaptive or dynamic expertise.

It includes the competence of effective solving of new problems, generation of new procedures and practices from expert knowledge, and a deep conceptual understanding. It is involved with so called innovative knowledge communities with shared expertise and knotworking action model (Engeström, Engeström & Vähäaho 1999). The knowledge creation takes place in the networked collaboration which are often build as ad hoc groups and in any case the members of the collaborative project have not known each others before the project. There are seldom long term permanent teams.

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General common observations

All the groups proved to be innovative professionals: 70 % mentioned successful new ideas implemented at work.

The role of the closest colleagues is very important, since it offers the first opportunities to test the new ideas.

Nevertheless, just in few cases the supervisors responded to the idea, tough despite this, the trust in the supervisors seems to be deep: the personnel consider that it is easy to talk and make suggestions in face to face discussions.

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From innovation chain to innovation networks - the models in innovation production

The case organisation was dominated by the traditonal linear, hierachical innovation **chain:**
After academic R&D effort and research there followed production with no expected contribution in innovations and knowledge sharing

<-> modern concept of innovation:
the collaborative innovation **network**, with opportunities, need and emphasizing of all members' contribution

Summary

Two professional groups:
- Different targets of the work
- Different type of environment of knowledge creation

Laboratory technicians: community of practise
Academic experts: innovative knowledge community (questions and tasks which cannot forecast)

There was identified two separated types of innovation and knowledge creation environment in the case organisation.

Is this an advantage or a problem?

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Thank you for your attention!

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