

# Socio-Technical Self-Descriptions as a Means for Appropriation

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## 1 Introduction

Processes of appropriation of groupware systems in organizations are social processes that are strongly intertwined with processes of reflection and communication. We suggest facilitating these processes by supporting the creation of socio-technical self-descriptions. Self-description is an important element of social systems such as organizations and can be extended to include descriptions of an organization's usage and adaptation of technology. In the following we discuss the concept of self-description; how support for self-description can effect appropriation of groupware systems; how the analysis of self-descriptions could be a measure for the degree of appropriation that has already taken place in an organization; methods for supporting self-description in the context of groupware; empirical experience with facilitating self-descriptions in projects.

## 2 Self-Descriptions

### **Self-Description in System Theory**

The relevance of self-descriptions for the understanding of the development of organizations is elaborated in system theory. In contrast to other types of systems such as e.g. biological systems, social systems do not possess anything physical – like a membrane – that constitutes their boundary to the environment. Social systems must maintain their boundaries in a continuous process of negotiation deciding which communicative acts are acceptable within the system and which are not. As an orientation for this process of distinguishing between outside and inside, social systems create and use self-descriptions that allow them to make a difference between the system itself and its environment (cf. Luhmann, 1995, p. 196).

Self-descriptions occur in many forms, a few examples are given to illustrate the concept.

### **Examples for Self-Descriptions in Organizations**

An **organization chart** that describes, who belongs to which department, is a self-description: it bears implications about hierarchical structures and information-flows. An **organization's mission** statement is a self-description, because it includes values that (should) guide the behavior within the organization. An **ISO-9000 process description** can be a self-description, because it describes expectations how certain tasks need to be carried out. All of these documents contain expectations that direct the individuals' behavior within the organization.

But self-descriptions do not only exist in written form as sustainable documentation. Self-description can also occur in more volatile modes such as oral communication or e-mail communication. A tradition like “we go for lunch each day at 12:30” can be part of a team's self-description; such traditions are usually not contained in official documents, they are rather passed on orally or in ephemeral electronic communication like chat.

If the organization uses a groupware system, then another, special, form of self-description is added: those self-descriptions that are inscribed in the groupware. Take **workflow systems** as an example: models of the organization's processes are encoded into a workflow system which then controls the coordination between its users. Also aggregated awareness data can be considered as a kind of self-description.

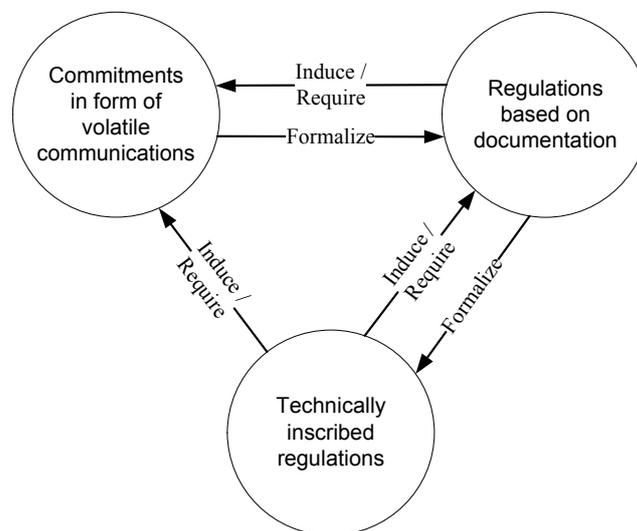
An organization's self-description is never one large canonical document, different forms of self-description add to the overall picture. The next section uses these examples to derive a more abstract description of the concept self-description.

### 3 Three levels of self-descriptions

Self-description within a social system takes two forms of appearance: as a process and as an artifact. As a process, self-description is made up by the continuous communications within the organization that keep alive its essential characteristics, norms and values. In this way, the process of self-description maintains the organization's identity as a unique social system that is distinguishable from other social systems.

Since communicative acts are ephemeral, organizations create artifacts that make important parts of the communications more permanently available. These artifacts are usually combinations of texts, graphics and other symbolic means.

In the context of socio-technical systems (e.g. organizations having appropriated a groupware) three levels of self-descriptions can be distinguished:



There are the volatile agreements that exist only as oral communicative acts; then there are documented regulations and then there are those rules that have become part of the groupware systems. The latter occur in various forms, for instance:

- the way how menus are organized
- the contents and structures of electronic forms
- the hierarchical structure of folders
- the sequence of actions in workflow management systems ...

All these characteristics of the groupware system do not merely fulfill a functional purpose, but they also describe characteristics of the social system and its way of using and adapting – and eventually appropriate - the technical system.

But no matter how deliberate the design process was, no technical system can unambiguously prescribe its usage. Therefore the organization will agree to

additional rules concerning the usage of the groupware system in the course of appropriation. As a result socio-technical self-descriptions occur in three forms as shown in the figure above.

The arrows between the three forms of self-descriptions indicate that there is an interchange between them. A self-description that first exists only informally e.g. in form of an oral agreement may be formalized and become part of an official document. Similar, the statements in a document may be implemented as features of a groupware. The other way around, a formal agreement always needs informal agreements into which it is embedded. The arrows leading from “technically inscribed regulations” to “regulations based on documentation” and “commitments in form of volatile communications” indicate this necessity.

## 4 Self-Descriptions and Organizational Change

What is the relationship between self-descriptions and appropriation of groupware? Processes of appropriation are processes of organizational change; and self-descriptions can be used to support processes of organizational change.

### **Self-Description as a Means of Systemic Intervention**

Methods of systemic intervention are methods based on concepts and insights of system theory that support processes of organizational change. The most important characteristic of systemic intervention is that it attempts to consolidate two seemingly contradictory aspects: intervention that strives to induce change processes towards a specific goal on the one hand, and the respect for the self-organizing characteristics of social systems on the other.

Self-descriptions are an important aspect of systemic interventions:

- a) Self-descriptions are necessary because they provide stability for the system by defining its boundaries and making basic regulations comprehensible
- b) Questioning the self-description can initiate processes of self-reflection and subsequent change that lead to a new self-description.

### **Deployment of Groupware in an Organization**

The deployment of a new groupware system effects a change within the organization that needs to be reflected in the organization’s self-description. The organization needs to describe how the new technical system is integrated into its network of communications. The process of including a new groupware system into the organization’s self-description is part of the process of appropriation.

We find the concept of self-descriptions fruitful for understanding and supporting appropriation processes of groupware systems because it combines two quite different aspects:

- a) Planned rather than completely arbitrary appropriation of a groupware system within an organization is necessary in order to achieve the goals for which the system was designed.
- b) Appropriation is a social process that is promoted in ways which are not comparable to the engineering processes for groupware systems.

## 5 Self-descriptions as Support for Appropriation

Our approach to supporting processes of appropriation is to support an organization in creating and maintaining socio-technical self-descriptions. The organization should

- explicate its usage of the groupware,
- discuss alternative options,
- reach conclusions about the usage,
- document the conclusions.

Functions of groupware systems can be used to support communication processes which promote the process of appropriation. This field has been explored extensively by the work of Volkmar Pipek (2005).

Our work tries to bind together three types of methods and instruments which aim at the successful adoption of technology and the evolution of its usage:

(1) A modeling method that provides symbolic means which are specifically suitable for the creation of written forms of socio-technical self-descriptions:

SeeMe, the diagramming-technique for modelling semi-structured socio-technical systems supports modelling of (technical inscribed) formal processes but also provides special modelling concepts for the representation of vagueness, incompleteness, and contradictions that are inherent to rules and agreements in organisations (Herrmann et al. 2000).

(2) An editor with which socio-technical models can be elaborated as well as presented in co-located workshop settings: Self-description, from one point of view, is a communication process where practice is reflected. Using complex diagrams for this purpose needs help to reduce complexity and focus certain aspects. The SeeMe-Editor is specifically designed to support step by step presentation of models as well as modifying diagrams in between the presentation, to visualize the results of the ongoing discussions developing the self-description.

(3) The socio-technical walkthrough (STWT) as a method for systematically facilitating communications in a series of workshops (Herrmann et al 2004):

The core idea of the STWT is that the concept or outline of a socio-technical system is represented by a diagrammatic model which is the outcome of a participatory design process. This model is either developed from scratch or is derived from an existing model – which usually presents the given state of the work processes – by gradually modifying its elements with respect to the

technology to be introduced. A model has to be inspected step by step before it is considered as the final solution, upon which most of the participants can agree.

## 6 Self-Descriptions as a Measure for Appropriation

So far socio-technical self-descriptions have been introduced as a means for supporting processes of appropriation. However, we also think that they could be used as a measure to judge whether and how deeply an organization has appropriated a groupware. The overlapping between the different forms of self-description can be taken as a measure for the process of appropriation: the more the symbolic structures of an IT-solution cover the self-description of a social system and its ways of interacting with the computers, the more has the process of appropriation evolved. And the more the self-descriptions refer to the groupware system and how it should be used, the more is this system incorporated into the organization

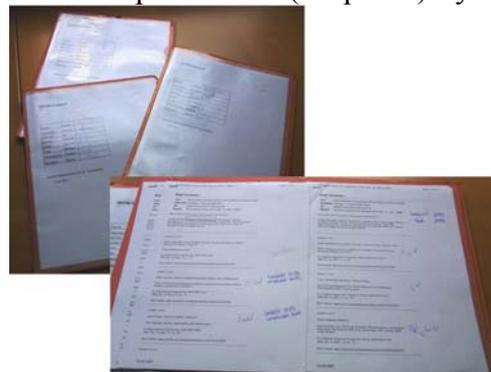
## 7 Empirical Work

During the past years we conducted numerous case studies in which the triad of modelling notation, editor and workshop-concept was employed, analyzed and improved. Among these case studies were:

- (1) KatEr – Planning new work procedures in a university library in the light of a new groupware system (Loser, 2002)
- (2) Modeling to define the structure and content of a knowledge management system for a consumer counseling agency (Herrmann et al, 2002)
- (3) SpiW – Socio-technical design of a mobile application for logistic companies (Herrmann et al, 2004)
- (4) Process Maps to improve collaborative learning (Carell et al, 2005)

For this E-CSCW workshop we provide empirical material from our latest case study named “ELISE”. The University of Dortmund replaced its procedure of circulating paper copies of the contents of scientific periodicals (cf. photo) by a system that sends out e-mails to inform the scientific staff about new issues and their content.

Within our work group we decided to design and implement an **electronic literature system** that ingests the e-mails and provides cooperative functions to support the easy communication and



coordination that was previously realized by notes on the circulating paper copies.

The figure on the last page illustrates how aspects of socio-technical self-descriptions are realized for ELISE.

- The structure of the menu buttons reflects the collaboration and the way in which the group works with journals; e.g. there are buttons to recommend certain articles to others.
- There are additional process diagrams that contain commitments about the way the group uses the system; e.g. the scientific staff will try to view new journals by Thursday of the following week; the students in the library will send out reminders every Thursday.
- As an example for communication beside the main regulations, an e-mail is attached in which one colleague asks to postpone the deadline. The e-mail demonstrates that the commitments (here, to skim through the journals until Thursday) are taken seriously but that it is also possible to agree to spontaneous changes.

## 8 Further Research

We argued for socio-technical self-descriptions as a concept to support processes of appropriation and as a basis for measuring how complete a process of appropriation of a groupware is. We also gave an empirical example of the concepts' relevance, also referring to the experience of various earlier projects.

The focus on socio-technical self-description suggests some interesting future research questions:

- When and where in the Software-Lifecycle can the preparation of the appropriation start by supporting socio-technical self-description (with respect to technical structures, the growing documentation, participatory design etc.).
- How far can software design and appropriation be overlapped and how far can socio-technical documentation serve as a boundary object to manage this overlapping?
- By which extent can the process of appropriation be actively promoted from outside or inside by referring to socio-technical self-descriptions.
- Can a “more or less” of appropriation be measured by analyzing the occurrence of socio-technical self-description?

## 9 References

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Von: Kai-Uwe Loser  
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 Betreff: AW: Elise-Tag

Bitte um Verlängerung ...

Ich habe mir bisher noch keine IV angeschaut. Ginge das, dass ihr wegen des Feiertags ;-) die IV erst am Dienstag abend auf Working setzt?

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