

From Workflow to Conversation

Jan Ljungberg



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Jan Ljungberg
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Abstract

This thesis is about designing information technology to support communicative work. The thesis has a theoretical focus, informed by two empirical studies, but the aim is not to formulate a grand theory, but rather to find new concepts and patterns of thought useful for design. It is based on five papers dealing with the phenomena *work, organization, communication* and *design of information technology*. Departure is taken in the view that the role of language is central in the postmodern arena, both as work (i.e. work is communication) and in constituting organizations. While there is research based on this assumption, there is still a great need to find new concepts and new metaphors when designing information technology to support communication and communicative work. The thesis examines, criticizes and elaborates communication models such as speech act theory, conversation analysis and genre theory as a foundation for design. In doing this, there is a number of classical issues in industrial work design applicable to communicative work as well, e.g. deskilling versus learning, rule following versus empowerment, local or global control, routinization versus flexibility, workplace democracy, participation in design, etc. These classical questions of work organization and potential effects of information technology on individuals, and organizations are addressed as well.

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Introduction

From Workflow to Conversation

1. Introduction

This thesis is about designing information technology (IT) to support communicative work. It is based on five papers (Chapters 2 to 6). The papers evolve around the phenomena *work*, *organization*, *communication* and *design of information technology* (IT). Departure is taken in the view that the role of language is central in the postmodern arena, both as work (i.e. work is communication) and in constituting organizations. While there is research based on this assumption, there is still a great need to find new concepts and new metaphors when designing IT to support communication and communicative work. The thesis examines, criticizes and elaborates certain communication models as a foundation for design. In doing this, there is a number of classical issues in industrial work design applicable to communicative work as well, e.g. deskilling versus learning, rule obedience versus empowerment, local or global control, routinization versus flexibility, workplace democracy, participation in design, etc. Some of these classical questions of work organization and potential effects of IT on individuals, and organizations are addressed as well.

1.1 Research objective

The thesis has a theoretical focus, informed by two empirical studies, but the aim is not to formulate a grand theory, but rather to find new concepts and patterns of thought useful for design.

The overall research question could thus be formulated as: *Given the central role of language and the changes in work and organization that has taken place in the last decade (as described in chapter 2 and 3), how could we articulate issues of design, and find new concepts and metaphors to guide us?*

With these general questions in mind, the title “From Workflow to Conversation” could be read in at least three ways:

- (i) It is reflecting the *turn from physical flows and information flows towards communication and interaction*. This means viewing work processes and business processes as communicative actions performed by people through the use of language. It thus means focusing on the role of language in work and organizing. This reading is mainly represented in papers *1 and 5*.
- (ii) The title also reflects a *turn from a modern, mechanistic view of work and processes to a postmodern, romantic view*, i.e., the move from IT supporting a sequential, globally managed, Tayloristic work organization (often inherent in workflow systems) towards IT supporting a situated, locally controlled way of working by autonomous, empowered actors. This change of view could also be applied to communication processes, and approaches to these. In speech-act theory a discourse is built up by a sequential flow of preplanned, coherent speech acts. According to conversation analysis, a conversation is managed locally by the involved participants, “on the floor”, backed by institutional rules as a resource. This reading is mainly addressed in *papers 1, 3 and 4*.
- (iii) A third way of reading the title is as a *spectrum of design – spanning from workflow to conversation*. That is, a spectrum ranging from information to communication, from mechanistic structures to flexible structures. Design choices will always include non-communicative parts, sequential tasks and routinization as well as flexibility and local power. This is addressed in *paper 2*.

1.2 Dissertation structure

The thesis consists of an introduction and five articles. In the introduction, changes in work, organization and information technology are outlined to form a background and introduction to the papers. This part is intentionally written in a less academic fashion. First, changes in work are described in section 2. Then in section 3, theories of language use are briefly described, followed by a summary of research utilizing these theories in informatics. In section 4, the research approach, and methodological issues are discussed. Finally, the papers are introduced and summarized. The papers are in the same shape as in the published versions, except that they are however reformatted:

- 1 Ljungberg J. and Holm P. (1996) Speech Acts on Trial, *Scandinavian Journal of Information Systems*, 8, 1, 1996.
 - First published in *Proceedings of the Third Decennial Århus Conference: Computers in Context - Joining Forces in Design*, Århus, Denmark, 1995.
 - Reprinted in M. Kyng and L. Mathiassen (eds) *Computers and Design in Context*, Boston. MIT-press, 1997.
- 2 Holm, P. and Ljungberg, J. (1996) Multi-Discourse Conversations, in *Proceedings of 4th European Conference on Information Systems - ECIS'96*. Lisbon, 1996.
- 3 Ljungberg, J., Holm, P. and Hedman, A. (1997) Information Technology and Organizational Effects: Supporting the Sales Process with Workflow Technology, in *Proceedings of SIGCPR'97, Conference on the effects of the new connectivity*. San Francisco, April, 1997.
- 4 Holm, P. and Ljungberg, J. (1997) Structures that Imprison and Structures that Free, in *Proceedings of 5th European Conference on Information Systems - ECIS'97*. Cork, 1997.
- 5 Ljungberg, J. (1997) Organizations and Conversation, Studies in the use of Information Technology, Report nr. 20, Informatics, Göteborg University.
 - Revised version of paper published in *Proceedings of IRIS 20 - Social Informatics*, Hankø, Norway.

2. Work and information technology

A simple way to approach work, organizations and design of information technology (IT), is to distinguish two main strands of thought: the mechanistic world view and the romantic world view (Dahlbom and Mathiassen, 1993). The *mechanistic worldview* is rooted in the enlightenment era of the 17th century represented by thinkers like Descartes and Leibnitz. The mechanistic science tradition is to map the world, and to give a systematic, axiomatized, definite true account of the world. Like Aristotle, proponents of this view believe that any *concept* can be totally defined by a set of primitive elements making it possible to make a complete structuring of the world (and making formalization of all knowledge possible). In contrast, the *romantic worldview* of the early 19th century relies on concepts like interpretation, uniqueness, chaos and change. *Concepts* are seen as prototypical instances primarily defined by our practices, not derivable from some limited set of primitives.

This dichotomy gives two main lines of thought in approaching phenomena such as work, organization, communication and IT-design.

2.1 From assembly lines to post-Fordism

At the heart of *mechanistic thinking* about the structuring of work are the principles of Taylor's scientific management (1911) and the way it has been implemented by its advocates. Here, efficiency is to be improved by concentrating on the routine aspects of work. Routine tasks were separated from planning and control, leading to an organization consisting of specialized hierarchical functions. Activities related to a specific task were spread over diverse functions according to responsibilities and specialization, with precise definition of rights and obligations and technical methods attached to each functional role. Roles, authority, rules, and work procedures were well defined and stable, and part of a hierarchical structure of control, authority and communication. Communication and

interaction between members tended to be vertical, i.e., between superior and subordinate.

The division of labor led to highly specialized workers using specialized machines to produce large volumes of goods, common in all western mass production (e.g. the car industry). Exceptions of the procedures were handled at a higher level in the hierarchy, where the appropriate authority and skills resided. The rational engineering of organizations and procedures concerned at the bottom level the design of optimal efficiency of material processes, e.g. by optimizing sequential processes of work with the assembly line.

This division of labor led to characteristics of work organization much debated, like consequences concerning health, dequalification of workers, alienation, centralization of control etc. (see e.g. Braverman, 1974).

Since the 1970s, significant changes in the world of work have occurred. The character, context and conceptualization of work and work organization are undergoing a fundamental transformation (Whitaker, 1992; Keen, 1991). Several intersecting forces are breaking up the social, economic and political structures of the post-war period. The most important of these forces are (Whitaker, 1992):

- The wave of technological innovation based upon microelectronics and information processing. These innovations both generate new industries and services and transform the operations of existing areas;
- The accelerating growth of the service sector, e.g. in finance and related areas;
- Political developments, involving reorientation and reconfiguration of government policy away from state intervention;
- Pressures on overall economic performance, competitiveness and position within the international economy.

From a business point of view, scientific management, seemed less appropriate when the environment became more dynamic. Followers of Taylor's idea's couldn't cope with rapidly changing customer demands, innovation in production technologies and increased skill requirements of the work force (Schäl, 1996).

The changes in the automobile industry described in Womack et al. (1990), is a good example of how a whole industry began a total reshaping on global level, to cope with these problems, and how the basic Tayloristic ideas changed into lean production.

When Toyoda and his colleagues designed the first Toyota car factory in the 1950s, they found that the Tayloristic ways of organizing work had several deficiencies. It was inflexible, requiring large volumes and long production cycles to pay the expensive machines. The work was highly routinized requiring low skilled workers who mainly had to learn some few operations. It also led to a high amount of errors in the manufactured goods. To cope with these deficiencies, several new ideas of work organization were proposed.

Toyotas managerial process was called *Lean production*. According to Womack et al. (1990) it combined the advantage of craft and mass production, avoiding the high cost of the first, and the rigidity of the latter. The continual improvement of *kaizen* encouraged change as part of the day-to-day operations. Just-in-case production gave way for *just-in-time* production, i.e., providing what is needed, in the amount needed at the time and place it's needed. Flexible machines shortened the product cycles, but required more skilled operators. Hierarchies were flattened and managers recruited from the workforce were placed in open desks next to the production line in.

The organization became the center of a network where customers as well as suppliers were connected to the organization by close relationships. The Japanese companies used information technology to gather digital information on markets, logistics and customer demands, as part of their customer focus.

Lean production led to characteristics of work organization, as much debated as the Tayloristic approach. Consequences concerning health were so large, that the Japanese government

coined a new term, *karoshi*, to explain the pathology of the new production-related illness. Some of the Japanese car factories generate three times more injuries, compared to the plants of Ford and GM (Rifkin, 1996).

The notion of the *post-Fordist* phase of development has attracted much attention in the 1980s and 1990s. In contrast to mass-production in the Fordist era, one of the key notions of post-Fordism is *flexibility* and the *flexible firm* (Whitaker, 1992).

“...in the era of Fordism you could have any colored car you wanted as long as it was black.” (Clegg, 1990, p. 18).

In the post-Fordist era, consumption is differentiated; colors and model variations are differentiated by car manufacturers such as Toyota and clothing companies like Benetton.

One could summarize these changes as going from rule obedience to customer satisfaction. The key to customer satisfaction is not to follow bureaucratic rules, but to be flexible.

2.2 The failures of office automation

The office automation movement in late 1970s and early 1980s illustrates very well the modern worldview of organizations as machines. When rationalization and automatization of routine work reached the office, the industrial rationalization of processes was mapped, viewing the information flows at the office on the model of the material processes in the factories, e.g. introducing Taylorism and assembly lines to the office (Schmidt, 1993). The paper flows in the office were treated in the same way as the material flows at the factory. In office automation, work was considered as information processing, the office was an information processing center (Taylor, 1993).

The idea of scientific management was to define each step of a work task in detail; each step a worker on the assembly line was doing was designed after detailed time and motion studies. In the same way the automatization efforts of the office were focused on the

individual task rather than the flow (the assembly line). Formal languages were designed to give exact definitions of office procedures, e.g. Office Procedure Specification Language (Zisman, 1977), Information Control Net (Ellis, 1981) and Office Analysis Methodology (Sirbu et al. 1981).

At this point, automation efforts were focused on the narrow office domain, i.e., and the administrative support processes. Thus, there was no notions of businesses processes or business goals, concepts that later came to be the heart of business process reengineering (Hammer & Champy, 1993).

The early office automation efforts were drawn on largely mechanistic foundations, and ended up in a fiasco. Human and social factors were largely ignored (see also Schmidt, 1993). According to Taylor (1993) office automation was not so much technically as conceptually, flawed:

“Its failure made us realize that we understood neither the technology nor the organization that was trying to implement it.” (Taylor, 1993, p. 29)

Studies showed that office work was not at all as routine as one could expect (Suchman, 1983). Ellis (1983) concluded on his earlier work in office automation, that the office domain was more complex than initially expected: it was dynamic, concurrent, and open-ended. Furthermore it consisted of a high amount of knowledge work that was only semi-structured or even ill-structured to its nature.

People worried whether important skills and knowledge of certain work groups would disappear in the future, due to work automation. Information technology was first and foremost a management technology, implemented to increase efficiency and control. A deskilled workforce could be paid less and would be easier to control (Braverman, 1974).

Despite its limited success, the early mechanistic approaches to model and define office procedures in various notations and formalisms have been influential in later efforts to model business processes.

2.3 The business reengineering movement

The ideas of process thinking and the process organization, dominating the organizational change rethorics in the 90s, is deeply rooted in the post-Fordist conceptions. The role of information technology is central, business is designed through IT (Keen, 1991). IT is used to implement the advantages of post-Fordist concepts like just-in-time inventories and just-in-time payment, point-of-sale, electronic payments, electronic data interchange (EDI) etc.

The process is the hart of the organization, and the process must create value for the customer (Hammer & Champy, 1993). In the process oriented organization, all activities related to a task are managed as one single operation performed by an individual or a dynamic customer-focused business team (Womack et al., 1990; Hammer & Champy, 1993; Keen, 1991; Schäl, 1996). The most important components in the business process reengineering approach (BPR) are *customer focus, flexibility* and a revolutionary redesign of the business enabled by *information technology*.

Redesigning a business, is in the business process reengineering approach, a top down matter, presupposing a view treating knowledge about working practice as a matter for experts (i.e., external consultants) and managers.

The most common versions of BPR have, despite their post-Fordist concepts much in common with the scientific management tradition. It is an engineering ideal, taking the possibilities for rational design of organizations and human processes for granted. Despite its aim at flexibility (and several other innovations), when it comes to application of the concept, BPR and scientific management seem to be based on many similar assumptions about organizations, i.e., that goals are known, that tasks can be fully analyzed, that resources like human labor are available in uniform quality and so on. Issues about conflict, democracy and power interest is abandoned or not explicitly dealt with.

Still, unlimited rationality and fully accessible knowledge is the prevailing representation of individual and organizational cognitive processes in most contemporary models for IT-design (Ciborra, 1993). Individual and organizational knowledge is in this

view fully accessible to an expert analyst. The limits of this view of rationality have been apparent in unsuccessful computerization projects, with end-user conflicts, low quality systems, high costs etc. Assessing the foundations of IS-approaches used in the (American) reengineering efforts of organizations in the 1990s gives an impression of a revisit to the 1970s office automation efforts. Little seems to have been learned. The only difference is that its Toyotism, not Taylorism that is the source of inspiration.

Taking a closer look at the business process literature genre gives three interesting observations at hand (Gerlach, 1996):

- (i) The BPR-literature is produced by business intellectuals who are consultants, executives and/or business academics. Often an author is occupying all roles simultaneously.**
- (ii) The writing is prescriptive, a sort of self-help literature targeting at organizations, rather than individuals.**
- (iii) The intertextual connections of the reengineering genre privilege certain authorities and exclude others. More critical organizational sociology experts have been excluded as intertextual sources, as the community of writers of the reengineering literature genre has developed their own authorities and discourse rules. One rarely finds social science references in the texts of the 1990s reengineering literature, resulting in a lack of critical reflection.**

Today, the concept of “BPR” has turned ugly:

“...to most business people in the United States, reengineering has become a word that stands for restructuring, layoffs, and too often failed change programs.” (Davenport, 1997)

This mechanistic and overly simplistic picture of work and organizations has despite its mediocre success, had a large impact on the IS-community.

2.4 Workflow management

Part of the IT-driven business design consists of technology for document- and workflow management. Even though BPR and workflow management is two separate phenomena (BPR could be performed without workflow and vice versa), workflow management is the most illustrative technology, with its focus on design of process and work automation. It brings with it the most fundamental post-Fordist concepts (customer focus, just-in-time etc.).

Workflow has become a widely used concept, motivating the existence of conferences, workshops, market surveys, books, and a plethora of products. However the term “workflow” is quite problematic, like many other terms denoting temporary hypes at the computer arena. Some authors view workflow automation as a new paradigm (White & Fisher, 1994), and some view it simply as a technological platform for automating office work. A portion of this platform is old technology (e.g. case-handling systems) repackaged with a new name, and a new interface. The remaining portion is giving the rapid development of process related technology (imaging, document databases, routing etc.), a common commercial label. As a product label, the term workflow is denoting a vaguely related set of technology.

While many basic issues, in the workflow arena, to their nature are fundamentally social, communicative, cultural, political, etc., the technical side is the most developed.

The information processes in offices are still mainly viewed on the model of material processes when rationalizing office procedures by means of workflow automation. The organization is still seen as a programmable machine. A workflow is normally defined as a sequence of actions to be performed on information objects in the flow, i.e.; the primary structure is the routing of information objects among users/workers, and specification of automatic actions to be taken in the routing. Implementing assembly lines in paper work and office organization, people are not seen as enabling agents but more often simply as elements to keep the flow moving (Bannon, 1994).

There are many reasons to view contemporary workflow technology as deeply rooted in the old office automation ideas, and a view of the office as a factory. As already mentioned, even the popular process thinking is in many respects, despite its customer focus limited to a view on organizations as factories. A second point is that much of the terminology, concepts, methods and thinking about designing work with workflow technology is rooted in old models of information systems, originally developed for main frame storage and data base design.

Thus, the underlying philosophy of much of the workflow technology today has ideological roots in Taylorism (Stark and Lachal, 1995). Limitations in functionality in many contemporary workflow tools reflecting this is:

- one person - one task;**
- one task - one tool;**
- strict roles;**
- rigid rules;**
- inherent monitoring and control, i.e., time and motion studies are built into the system.**

These limitations are due to both technical and conceptual circumstances. Other problematic issues, related to those mentioned above, are that workflow systems tend to:

- sequentialize work tasks;**
- specialize skill linked to specific roles;**
- freeze process design;**
- lack notions of empowerment, e.g. possibility for authorized users to improve process design on the fly.**

A variety of research experiences challenges these characteristics inherent in much of contemporary workflow technology (Bowers et al., 1995; Sachs, 1995; Stark & Lachal, 1995).

However, it would be unfair to judge the whole workflow arena by these terms. There are approaches that go beyond the Tayloristic deficiencies, recognizing the increased demands on flexibility and agility in processes and organizations (e.g. Abbot & Sarin, 1994; Prinz and Kolvenbach, 1996). In contrast to early office automation, many workflow approaches aim at managing processes and coordination of several individuals, and not automating the individual tasks (Abbot & Sarin, 1994).

2.5 Work practice

Following *the romantic mode of thought* leads to a tradition of “work-centered” or “activity-oriented” approaches, e.g. participatory design (e.g. Greenbaum and Kyng, 1991), activity theory (e.g. Kuuti, 1994) and the tools approach (e.g. Ehn, 1988). The notions of *activity*, *work* and *work practice* are central here. At the lowest level of performance, in the daily operations, problems are encountered and solved, leading to a working community, with a certain inherent complexity and vitality, and a continuously evolving *working practice*. This practice will subsequently deviate from the defined processes and procedures (if they ever have corresponded). When management specifies procedures to be efficient and effective means to certain ends, they are often shown to be highly idealized and inadequate for analyzing and modeling the articulation of real world (cooperative) work arrangements (Bannon, 1994).

Examples of failures in system design due to underestimating the complexity in work practice are found in (Bowers et al., 1995; Sachs, 1995). As noted by Suchman (1995):

“...work has a tendency to disappear at a distance, such that the further removed we are from the work of others, the more simplified, often stereotyped, our view of their work becomes.”
(Suchman, 1995, p. 59)

Work oriented approaches do take a closer look on what goes on in work. This could be done by unfolding work practice by ethnographical studies as in e.g. (Bowers et al., 1995).

In the *tool perspective*, the computer artifacts are viewed as *tools* supposed to fit the work setting, where they will be part of the work by skilled users to create high-quality products. Essential parts of the knowledge and skills needed for using the tools are tacit, and can not or should not be made explicit or formalized (Ehn, 1988). This perspective is deeply influenced by tool design in traditional crafts, and the aim is not to automate parts of the labor process, but to provide the craftsman with computer-based tools by which original skills still can be applied and developed.

Activity theory is a theoretical framework for studying different forms of human praxis (Kuuti, 1994). There are three main components: the *subject* (actor) of the activity, which is directed towards an *object*, which is shared by *a community*. The relationships between these components are mediated by different phenomena: actor and object by a *tool*, subject and community by *rules*, and community and object is mediated by *division of labor*. Thus, computer artifacts mediate human activity within a praxis. Activity theory as an approach to design has been exploited in IS and CSCW-research and development, placing work activity in focus (see Kuuti, 1994). It has also been used in relation to workflow systems (Bardram, 1997).

The *Scandinavian school* and *Participatory Design* (PD) were shaped around issues of democracy, power and control in the workplace (Ehn, 1988; 1992; Clement and Van der Besselar, 1993). At the heart was also the belief that the participation of skilled users in the design process would promote successful design of technical artifacts with high quality and usability, something traditional methods failed to do. Since the design and implementation of IT-artifacts in a work process, also is design of that work process, implications for the work process and the workers must be on the agenda. The people who perform the day-to-day work must be involved, since they are the ones who know how it is done.

The work-centered and activity-oriented approaches exclude views from a strategic or business point of view. This makes it hardly

surprising that they so rarely are used in approaches to business reengineering or workflow automation.

2.6 Work as communication

In the end of the last century, when Americas rail road organizations were the largest organizations to find, *communication* was a means to report through the organization, to give top management an accurate and continuous account of the progress of operations (Yates, 1989). *Information* was seen as recorded communication, forming an organizational memory used as a basis for understanding, maintaining, and improving operational efficiency and financial performance. *Internal communication* thus served as a managerial instrument, and control mechanism in response to growth, e.g. in monitoring work, in distribution of rules, in work task descriptions, etc.

Technologies for producing, copying, and filing documents, influenced the shape of new forms of internal communication, and contributed to the specialization of office skills. Now the office had specialized workers, skilled in using particular machines, just as in the factory (ibid.). *Upward communication* consisted of reports on work status and resource consumption as basis for management to make plans. *Downward communication* consisted of a flow of directives, rules and policies, represented by circular letters, manuals and task instructions.

For management, formal communication was an important instrument for control. While executives and managers spent a large part of their daily routines engaged in talk (Boden, 1994), the white-collar workers in the office were supposed to “shut up” and do their work.

The rules in the office were formulated with the overall goal that employees should concentrate on their work tasks. The fundamental rule was that the working day should progress as silently as possible (Conradson, 1988). There were rules; (formulated or tacit) regulating whom could initiate a conversation with whom, and in which context.

**“When my boss dictated a letter, one never talked about topics beside the job, if not the boss was in the mood and started...”
(Conradson, 1988, p. 149)**

The rules didn't only regulate conversations between superiors and subordinates, but also between generations.

“If she/the older one/ started, you answered, but you didn't initiate it your self.” (Conradson, 1988, p. 149)

The view of communication as a managerial instrument and something abandoned in everyday work (if not absolutely necessary), was a central conception of the industrial society. In the post-industrial era this conception is declining, but still exists as relic of a bygone epoch.

Consider the TTS system (Trouble Ticketing System), a system to schedule and keep a record of telephony company workers developed in early 1980s, described by Sachs (1995). Before TTS, the workers used to have trouble shooting conversations, i.e., dialogues about what was going on in both ends of the circuit. TTS then was designed with the idea that conversations were spent “off-task”, and not a very efficient way to work. TTS was designed to eliminate conversations, i.e., it translated conversations into linear series of tasks, printed out on tickets (i.e. work orders) picked up by workers with no interaction with one another. The effective network of trouble shooting conversations was, hardly surprising destroyed.

For many tasks at any level of an organization, the very nature of work has become intensively communicational. Today work *is* communication (and vice versa), not only in institutional interactions in which tasks are accomplished through the exchange of talk between laymen and professionals, e.g. in court, in health checkups etc., as described in Drew & Heritage (1992). In virtual work and virtual organizations it is natural that communication is considered as core work, not as an adjunct or support function for work (Grenier & Metes, 1995). This means that work is extensively carried out by actions performed through language. Consider how much of an ordinary workday that is devoted to informing others,

collecting information, questioning, arguing, deciding, negotiating, promising.

All these actions are real actions with a potential of changing the world; still they are truly performed by uttering (or writing) words in a language. The point is that it is not only management's communication that is important, or communication for reporting, and rule distribution. Coordination of work tasks is to a large degree locally performed through communication among participants, but in many cases, communication is also part of the value creation in itself. It is through dialogue and conversation value is created, learning takes place, work is accomplished, and organizations are constituted.

2.6.1 From information to communication

Another way to describe this evolution is through the three basically different domains or abstraction levels of activity in a described by Medina-Mora et al. (1992).

Material processes concern human activities rooted in the physical world. Physical things are moved and change state. In factory automation this was the relevant domain. Re-design has made these processes more efficient since the beginning of Taylorism until the robot-frequent factories of today.

Information processes are replacing the material process domain, in capturing what is important about work activities today. With the introduction of computers, the physical work becomes office work. What now becomes a greater part of the work activities is the talking and typing in it self. Techniques for analyzing information flow and information processing are missing the point that the information in itself is uninteresting (Medina-Mora et al., 1992). Information is only useful because someone can do something with it.

Business processes (i.e. communication processes) is the domain where people enter into language actions that have consequences for their future activities. "When a customer hands a supplier an order form, there is a physical activity (transferring a piece of paper) and an information dimension (communicating a

form with information about a particular set of goods, delivery instructions etc.). But the true significance is in the business process dimension: It is a request for the supplier to perform some particular actions, in return for which the customer is committed to perform other actions (e.g., payment).” The basic structure of the business dimension includes concepts of workflow, roles and acts and the incompletions they lead to, which constitute expectations for the further behavior of the participants. Information processes are implemented in material processes, as are business processes implemented in information processes.

2.6.2 Service work

The most profound example is service production, which is very different from the production of goods. Service is immaterial; it cannot be stored in warehouses. Therefore it is hard to decompose the service process into separate activities of production, distribution, and consumption as one used to do with the physical process. Service is consumed in the same moment it is produced, as already noticed by Adam Smith:

“The labor of the menial servant, on the contrary, does not fix or realize itself in any particular subject or vendible commodity. His services generally perish in the very instant of their performance, and seldom leave any trace or value behind them for which an equal quantity of service could afterwards be procured.” (Smith, 1776, p. 430)

“Like the declamation of the actor, the harangue of the orator, or the tune of the musician, the work of all of them perishes in the very instant of its production.” (Smith, 1776, p. 431)

Service work certainly involves a large amount of interaction with the customer. This interaction may be a large part – or all – of what creates value for the customer. Thus, much of service work is to its core communicational, like banking, insurance, consulting, health care, marketing, technical support etc. Work is thus becoming increasingly dependent on communication technology.

2.6.3 Ordering processes

As another example consider the ordering process at any retailing company. To order a product is in many cases a highly routinized communicative process, including a customer and a salesperson. The customer calls or faxes the salesperson to ask questions about price and product configurations and then places the order and perhaps negotiates the price. The sales person types the order into the computer, i.e., place it in a database or sends it to the warehouse, where someone picks the pieces together and then lets the distribution handle the rest of the flow. A sales process like this is described in Holm et al., (1996) and in *paper 3*.

Most of the actions taking place here are communicative actions, e.g. the customer asking questions, requesting a product or service, agreeing to pay at delivery, the sales person answering questions, negotiating the price, promising to deliver, requesting the warehouse to ship the goods, the account department checking up the payment etc. These processes have been substantially rationalized. First by making price and product information available to the customer in digital format (e.g. Lotus Notes or on the Internet). Then there were possibilities for the customer to make orders direct in e.g. Lotus Notes (or lately in Internet) or by sending an email message. Workflow systems speeded up the internal management of customer orders, coordinating different parties involved in the process (e.g. customer, sales person, warehouse, distribution, technician, consultant, accounting etc.). Here it is crucial to be able to override the system in certain areas; e.g. the sales person may have authority to overrule prize limits in the system in dealing with a large customer.

While the situation described above is characterized of recurrent patterns with a high degree of routine, other marketing/sale situations are more qualified and ad hoc to their nature. One such example is dealing with large customers, where specific sales persons often are dedicated to one customer. As described in *paper 3*, these sales persons, work in a deep relationship with the customer based on trust and the sales persons qualified knowledge of the customer processes. It is easy to imagine that an ethnographic study of these persons' conversations with the

customer would uncover recurrent patterns too. These conversations would, however, hardly be able to routinize and automate, since they are highly situated, i.e., bound in time and space and the immediate circumstances of the involved parties.

The ordering process as it is described here is also an example how the business/communication process (sales, negotiation etc.) is built upon information processes (numbers, price etc.) and material processes (the delivery of goods).

2.7 New organizational forms

Burns and Stalker (1961) introduced a distinction between *mechanistic* and *organic forms* of management systems. The mechanistic form, they claimed was appropriate for stable conditions.

The modern organization in its form of *bureaucracy* is rigid and mechanistic, with a predetermined and predictable behavior of its actors. The bureaucracy relies on rules in prescribing behavior, i.e., it is programmed (Dahlbom and Mathiassen, 1993). Stability, order and control are the hallmarks of bureaucracy (Clegg, 1990). When the environment is unstable and changing and uncertainty increases, the bureaucratic structures become an impediment for change.

Rule based workflow technology, as described earlier, may be seen as the typical technology to rationalize bureaucracies. Rule following may be inscribed by computerized routines. Monitoring of work and time and motion studies are built into the system. Typical examples of this use of workflow systems are found at banks and insurance companies and in the rationalization of paper work in the public sector.

The post-Fordist era with the wave of technical innovation, globalization of economy, and competition, together with political reorientation and deregulation of markets, brought about an unstable environment, making the bureaucracies, rationalized or not, increasingly inadequate.

2.7.1 Postmodern organizations

The *organic form* of organization is, according to Burns and Stalker (1961), better suited for changing conditions, i.e., unforeseen problems and requirements for action cannot automatically be broken down to functional roles defined within a hierarchical structure. Here, *commitment* is to a large degree replacing the following of rules and technical definitions of work tasks. Communication and interaction tend to be lateral rather than vertical, and consulting rather than commanding, i.e., the content of communication consists more of information and advice than instructions and decisions (ibid.).

Clegg's (1990) notion of the *postmodern organization* (i.e. clans, markets, and networks) is like Burns and Stalker's organic form of organization, shaped for coping with dynamics and change. It is almost an anti-thesis to the bureaucracy and the modern organization:

“Where modernist organization was rigid, postmodern organization is flexible. Where modernist consumption was premised on mass forms, postmodernist consumption is premised on niches. Where modernist organization was premised on technological determinism, postmodernist organization is premised on technological choices made possible through ‘de-dedicated’ microelectronic equipment. Where modernist organization and jobs were highly differentiated, demarcated and de-skilled, postmodernist organization and jobs are highly de-differentiated, de-demarcated and multi-skilled.” (Clegg, 1990, p. 181)

To meet the demands on flexibility, a variety of new organizational forms have emerged, such as virtual teams, strategic alliances and network organizations etc. (Barnatt, 1995). Home working, telecommuting, hot desk environments, hotelling, and support for mobile work are all technical arrangements to support these organizational forms, which are a result from both the pressure from changes in the environment, and opportunities of new information technology.

As noted by Introna (1997), the notion *virtual organization* functions almost as a perfect anti-thesis to the bureaucracy. However, the concept is not unproblematic or generally agreed upon. Virtual organization is sometimes seen as a network or loose coalition of partners uniting for a specific business purpose. Sometimes it denotes the use of information technology to execute temporary alliances with others (Barnatt, 1995). Another common view is that the notion of virtual organization simply comprises a collection of management theories.

These new forms of organizations are enabled by the development in information technology – such as computer support for collaborative work, electronic commerce, computer mediated communication etc. – and a growing installed base of infrastructure. It is also obvious that language and communicative actions plays a crucial role in these new organizational forms, where commitments, negotiations and other forms of interaction will be at the core.

2.7.2 From organization to community

As a further dissolution of the conception of organization, the notion of community has drawn a certain attention in recent years. Examples range from the computer-linked community councils consisting of representatives of neighborhood etc. (Hiltz & Turoff, 1993), to the kind of place exemplified by on-line communities like the WELL¹ (Rheingold, 1994) and Cafe Utne (Erickson, 1996).

The notion of community is interesting both theoretically and practically. It represents a more loosely coupled set of members than an organization, with less (or no) formal criteria for membership obligations or requirements (Erickson, 1996):

- **Membership:** the conception of community means that some people are in, others are out. The criteria for membership in a community range from sharing particular ideas or interest, to meeting certain requirements on geography, gender, ethnicity etc.

¹ Whole World 'Electronic Link

- **Relationship:** members of a community form personal relationships of different kinds, yet, communities generally are too large for everyone to know one another.
- **Commitment:** a sense of mutual commitment to the community is implied, i.e., one may help one another just because of community membership, not personal relationship.
- **Shared values and practices:** members may share a common set of concerns, values, goals, practices, procedures and symbols. They typically have a shared history, shared artifacts and places.
- **Collective goods:** communities participate in the creation, control and distribution of collective goods.
- **Duration:** the community as a collective is expected to have a long existence.

In linguistics there is the notion of *speech community*, which is roughly composed of those who shares the similar linguistic rules (there are several definitions), e.g. the English-speaking world. It could also be based on shared norms, as regularities in the use of language.

In genre analysis there is the notion of *discourse community*, i.e., how language is used within a group of people linked together by occupation, working premises, special interests etc. Like all definitions of community used in social sciences, it includes a dimension of shared knowledge, possessions, or behaviors. A discourse community recruits its members by persuasion or relevant qualification (Swales, 1990), as distinct from a speech community (Saville-Troike, 1982) which typically inherits members by birth or adoption.

Virtual communities, i.e., communities on the net, have come to play an important role in the diffusion of Internet. A virtual community is used to denote a long term, computer mediated conversation in a large group of people. When enough people carry on discussions long enough on the net they form social aggregations of personal relationship constituting a virtual community

(Rheingold, 1994). They are mostly related to synchronous chat systems as IRC², asynchronous conferencing systems as the WELL (Rheingold, 1994) and systems like MUD³ and MOO (Erickson, 1996). The early virtual communities were mainly driven by idealistic, anti-commercial values, and existed as a purely social phenomenon (e.g. the WELL, Rheingold, 1994).

The conception of virtual community is now entering the scene as a new business model and a commercial enterprise (Hagel & Armstrong, 1997). Virtual communities will have the power to reorder the relationship between companies and their customers, combining an increased product and service information and a broad range of social communication.

The notion of community, in the forms of virtual communities and discourse communities, I believe, will play an important role in the future conception of organizations, as well as in the creation of new services.

² Internet Relay Chat

³ Multi User Dungeons

3. Language and communication

A chapter on approaches to communication might very well have started with Shannon and Weaver's (1949) mathematical theory of communication (i.e. information theory). The argument for not doing this is that their theory is neither a theory of information, nor a theory of social communication. It is only dealing with signal-information, not semantic information (Lyons, 1977a). The question of signal transmission is treated autonomously from symbol structure and does not take the most important features of human communication into account, i.e., structure of language, meaning, interpretation, and context etc. Shannon and Weaver's theory, is a theory of data transmission useful in channel design etc., but has nothing to say about the computer as a medium for social communication.

3.1 From language systems to language use

For a long period, language philosophy was mainly concerned with truth conditional semantics of statements. Linguistics was mainly concerned with the structure of language, i.e., the language as a system (Saussure, 1916; Chomsky, 1957; Lyons, 1968). The systems view was forcefully formulated by Saussure in the distinction between the language system (*langue*) and language-behavior (*parole*). The structure of the language system, *langue*, was according to Saussure the most important to study. The view of the language system as the most important, was shared by Chomsky (1965), when he made a distinction between *competence* and *performance*. Competence is the knowledge of the abstract rules of the language system, e.g. grammar, lexicon etc. Performance is the skill to use language in an appropriate way in different situations, i.e., to utilize the competence. Chomsky himself was mainly focusing on competence, i.e., the knowledge of the language system.

“If we hope to understand human language and the psychological capacities on which it rests, we must first ask what it is, not how or for what purpose it is used.” (Chomsky, 1968, p. 62)

Many linguists and semanticists tacitly assumed that language was used solely, or primarily for the communication of factual knowledge (Lyons, 1977a). Saussure (1970) and the other structuralists were influential here. The work in structural semantics on *semantic fields*, and other sense relations as *hyponomy*, *part-whole*, *componential analysis* etc., are examples of this. Another example is the work in logical semantics where the narrow focus on the referential functions of language, implied that a language’s only function is to be descriptive, to give a true or false account of state-of-affairs. This inability to deal with, or recognize other functions of language, Austin (1962) called the *descriptive fallacy*.

Austin was one voice in defining a new direction for language philosophy focusing on language use and language as a way to perform. Wittgenstein (1958) had a most central role in setting out this direction, in arguing that the emphasis on logically self-contained formal systems must be replaced by a focus on language as a form of action. This view generated much work in both philosophy and linguistics. The theory driven work in philosophy like Searle (1969) and Grice (1979) are well known examples. Searlian speech act theory, especially in the later formalizations (e.g. Searle & Vanderveken, 1985) is cognitively oriented, focusing mainly on the intentions of the speaker. In linguistics more empirically informed work and critical approaches to Searlian speech act theory occurred (e.g. Allwood, 1976).

Several other areas and disciplines contributed to the shifting view of language: e.g. ethnomethodology, conversation analysis, ethnography of speaking, and the work of Bakhtin and Vygotsky. These approaches were all empirically driven. Further more, these approaches didn’t assume language to be a closed system, but doubly contextual: talk is both shaping and shaped by its context. Thus, context is not a set of parameters statically surrounding strips of talk. Context and talk are in a mutual relationship to each other (Goodwin & Duranti, 1992).

3.2 Language and design

Language has always played an important role in the design of information systems. The basic view we take on language and communication will have a large impact on the design of software, and the analysis of organizations and work. However, the role and foundations provided by language views have not always been explicitly noticed in the IS-community.

When the basic functions of the computer was to store data, and to manipulate symbols, the view of language as a formal system naturally dominated in the computer science as well as the IS-community.

Today it's not very controversial to say that the main metaphor of the computer is not a storage device or computation machinery, but rather a medium for social communication. Consider the rapid diffusion of Internet in the nineties. Internet was originally proposed for remote computing, but instead the diffusion was driven by the fact that a vast majority of people used Internet to communicate with each other (Winograd, 1997). This shift has many important implications on basic views and models of language to inform design. If we view the computer as a medium for social communication, the logical approaches to communication, and the formal languages has very little to say to us.

There are several examples of research addressing language views used in IS-design, and proposing a shift of views, e.g. Andersen (1990), Lyytinen (1985), Holm & Karlgren (1995). Andersen examines three paradigms of language, which has been used in the computer science field:

- The generative paradigm: language as string-manipulation has had a profound impact on computer science. Formal grammars, automata theory and the Chomsky hierarchy influenced the design of computer languages and compiler construction. This paradigm were also used in NL-interfaces, and machine-translation systems (e.g. Ljungberg, 1991).

- **The logical paradigm: language as reasoning** has influenced largely work in computational linguistics, e.g. the use of logic grammars (e.g. Amble et al., 1989).
- **The European structuralist-paradigm: language as creation of meaning** is based on systemic or functional grammar (e.g. Bøgh-Andersen, 1992; Holmquist, 1989).

Lyytinen, (1985) identifies five language views influential to IS: truth-functional semantics in database design and conceptual modeling; Chomskyan grammar in NLI-design; cognitive approaches in HCI- and expert systems design, Skinnerian behaviorism in decision support, and theories of communicative action in design of organizational processes and change. See also Hanseth and Monteiro (1994) for a critical discussion.

Holm and Karlgren (1995) identifies three views of language, which has influenced IS-design: the referential view, the individual (cognitive) view, and the social view. They describe a change in focus from the referential to the social.

These authors have in common that they all claim the importance of a change towards a social view of language in IS-design. They are all representing a shift in view from the language system to language use, a shift in using theories and models of language as a system, to theories of language as a means for action and social structuring.

3.3 Communication as action

There are now a number of different approaches to language use and communicative action. The purpose of this section is to give a brief overview. Here, formal approaches to text, dialogue and discourse representation are not covered, e.g. possible world semantics (Dowty et al., 1981), specific formalizations of speech act theory (Perrault, 1987) and other formal accounts of discourse phenomena aiming towards possible utilization in artificial intelligence applications. These are all seeking to formalize units

above the sentence, and do not account for social and dynamic aspects of language use, and are thus out of scope for this thesis.

Viewing language as a social instrument, focusing on language use and the functions language plays in social behavior, will include language philosophy, many of the social disciplines and of course linguistics. In linguistics, *pragmatics* incorporates a set of approaches and theories of language use from different areas like e.g. sociology, ethnography, anthropology etc.

Morris, introduced the term *pragmatics* for the study of language use (1938), i.e., the study of the relation of signs to the interpreters, in contrast to what he called *syntax* (the formal relation between signs in the system) and *semantics* (the relations between signs and the objects to which the signs are applicable).

Pragmatics is not a well defined discipline, the border between semantics and pragmatics is not clear-cut, i.e., making a distinction between meaning in general (semantics) and meaning in context or use (pragmatics) is not obvious (Allwood, 1981). Rather than being an add-on to a core of compositional semantics, much work in pragmatics could be viewed as a different approach to semantics. Whatever we call it, we are interested in language use, as it applies to dialogue and discourse.

Discourse is often defined in two different ways: as a specific unit of language (above the sentence), or as a particular aspect of on language use (Schiffrin, 1994). These two definitions of discourse, i.e., discourse as structure and discourse as function, reflect the difference between formalist and functionalist paradigms (ibid. see figure 1). Looking at models of communication and theories of language use from this point of view, turns out to be a dichotomy similar to the one used in the earlier chapters, i.e., between mechanistic and organic views.

<i>Structural</i>	<i>Functional</i>
Structure as grammar (code)	Structure (acts, events) as ways of speaking
Analysis of code in focus; use implements or limits code	Analysis of use in focus; code and use in dialectic relation
Referential function	Stylistic or social functions
Elements and structures analytically arbitrary or universal	Elements and structures as ethnographically appropriate
Functional equivalence of languages; all languages essentially equal	Functional differentiation of languages, varieties, styles
Single homogenous code and community	Speech community as matrix of code-repertoires
Fundamental concepts, such as speech community, speech act, fluent speaker, functions of speech and languages, taken for granted	Fundamental concepts taken as problematic and to be investigated
Language primarily seen as a mental phenomenon	Language primarily seen as a social phenomenon
Language is studied as an autonomous system	Language is studied in relation to its social function

Figure 1. Dichotomy of structure/function (Schiffrin, 1994).

Formalists (e.g. Chomsky) regard language primarily as a mental phenomenon, while functionalists regard it as a social phenomenon. Formalists explain linguistic universals as deriving from a common genetic linguistic inheritance of the human species, while functionalists explain them as deriving from the universality of the uses to which language is put in human society. Formalists explain children's acquisition of language in terms of a built-in human capacity to learn language, whereas functionalists explain it in terms of children's communicative needs and abilities in the society. Most important, formalists study language as an autonomous system, while functionalists study it in relation to its contextualized social function.

Talking about communication as action, starting over with a discussion of structure versus use may be confusing, but even within

the domain of communicative action it is possible and useful to make this distinction. Bazerman (1994) has formulated this well:

“In Saussurean terms, speech acts exist precisely where langue and parole meet, at the alive utterance. Any attempt to reduce speech acts to a speech system, removes the activity from the act and reduces complex, interpretive, intelligent, motivated human behavior to a static set of signs, no longer responsive to human needs and creativity.” (Bazerman, 1994)

3.3.1 Speech act theory

Most of the earlier work in language philosophy dealt with language as a means to assert propositions about the world. If the proposition corresponded to the world it was true. Austin recognized that truth conditional semantics was troublesome for utterances that were not descriptive, but rather constituted actions. The saying of certain words changed the world, rather than described it. The failure of traditional semantic theories to deal with this problem, he called the descriptive fallacy.

“It was for too long the assumption of philosophers that the business of a ‘statement’ can only be to ‘describe’ some state of affairs, or to ‘state some fact’, which it must do either truly or falsely.” (Austin, 1962, p. 1).

Austin first called the non-descriptive utterances *performatives*: baptizing, marrying etc. An explicit performative is easily checked in that one may naturally put “I hereby” in front of the utterance. Related to the performative utterances is a special class of performative verbs (e.g. apologize, criticize, approve). Performatives are not judged to be true or false, as the utterances Austin preferred to call *constatives* in favor of descriptions, rather they are successfully or unsuccessfully performed. To be successfully performed, the felicity conditions must be fulfilled, e.g. to give a sentence in court, the act must be performed by a judge.

Austin further developed his theory to a distinction between three dimensions of an utterance:

- The locutionary act, which is the utterance of a certain sentence, with sense and reference (i.e. can be truth or false);
- The illocutionary act, which have a certain conventional force (e.g. ordering, undertaking, warning), and may be successfully or unsuccessfully performed;
- The perlocutionary act is what is achieved by the utterance (e.g. convincing, persuading, and misleading).

Austin classified utterances according to their illocutionary force in five classes:

Verdictives (e.g. the giving of a verdict by a jury); *Excercitives* (e.g. the exercising of power as voting or advising); *Commisives* (i.e., committing the utterer to some action as e.g. promising or undertaking); *Behabitives* (i.e. related to social attitudes and behavior as apologizing and congratulating); *Expositives* (relates utterances to the fit into a discourse, e.g. I reply and I argue). Austin did not view these as a final categorization, but found especially the two last classes troublesome.

While Austin's theory was open-ended, Searle (1969; 1979a; 1979b; Searle & Vandevenen, 1985) made it formal and Aristotelian, with a set of necessary and sufficient conditions constitutive of specific acts.

“We have claimed that as far as illocutionary forces are concerned there are five and only five fundamental types and thus five and only five illocutionary ways of using language.”
(Searle & Vandevenen, 1985, p. 52)

He identified five fundamental illocutionary forces or acts, i.e., things possible to do with language.

- *A representative* is to make a proposition about the state-of-affairs, and commits the speaker to the truth;
- *A directive* is a means to get the hearer to do something, e.g. questions directs the hearer to respond with an assertive speech act, and command directs the hearer to carry out some linguistic or non-linguistic act;

- *Commissives* commits the speaker to some future course of action;
- *Declaratives* change the reality in correspondence to the speech act, e.g. pronouncing a couple married.
- *Expressives* express a psychological state e.g. apologizing, praising.

Searle's speech act theory has been criticized by several authors (e.g. Allwood, 1977; Levinson, 1993; 1980), and especially it has been undermined by the growth of empirical studies of language use (Levinson, 1983). Searlian speech act theory was influenced by the cognitive turn of linguistic studies characteristic of Chomskyan linguistics, and shifted the main interests in linguistics from conventions and context to a focus on intentionality and speaker's inner psychological states (Duranti & Goodwin, 1992). Viewing the speaker as the sole originator of the meaning-making process becomes problematic in addressing any need to reference social norms or conventions that exist outside of the speaker's intentions to communicate (see also *paper one*).

3.3.2 Conversation Analysis

Conversation analysis is based on phenomenology. The underlying concerns were articulated by the sociologist Harold Garfinkel (1967), developing the approach known as ethnomethodology. As described in (Schiffrin, 1994) ethnomethodology was applied specifically to conversation by Sacks, Schegloff, and Jefferson. Conversation analysis and ethnomethodology seek to discover the methods by which members of a society produce a sense of social order (see Levinson, 1983; Drew & Heritage, 1992; Schiffrin, 1994).

In conversation analysis we focus on talk as a basic instrument for social action, combined with a concern for the contextual sensitivity of language use. It is grounded in the study of ordinary talk in a variety of settings.

Conversation analysis is an interactional approach to units of discourse, i.e., "the sense of an utterance as an action is an interactive product of what was projected by a previous turn or turns at talk and

what the speaker actually does” (Drew & Heritage, 1992). The illocutionary dimension of the current utterance is integrated with the perlocutionary dimension of the prior utterance.

Conversation analysis is concerned with how language both creates and is created by social context, i.e., one views communicative action as both *context-shaping and context-renewing* (Drew & Heritage, 1992).

The *organization of conversations* according to conversation analysis is governed by a set of mechanisms: turn-taking, adjacency pairs, repair, openings, and closings.

Conversation is characterized by *turn-taking*, i.e., the distribution of talk among participants: one person talks, she stops, another person starts etc. At any point the speaking person, who “holds the floor”, can continue to speak, give the word to some other person, or be interrupted by another participant. The mechanism that governs turn-taking is supposed to operate on a turn-by-turn basis, i.e., it is *locally managed* at the floor by the participants in the conversation. It is guided by a set of rules, which could be viewed as a resource to help the participants share the floor.

Adjacency pairs are one of the basic building blocks in the local organization of conversation. It is a pair of related utterances such as question–answer, greeting–greeting, offer–acceptance etc.

In *everyday conversations*, local control is maximized over both the distribution of turns, and the subject matter. Who talks and what is talked about is decided in the situation, at the floor, then and there, by the participants in the conversation. The course of the conversation is collaboratively constructed by the participants (Suchman, 1987). Any communicative action is thus situated in specific social and physical circumstances.

In *institutional settings* turns are at least in part pre-allocated rather than determined on a turn-by-turn basis, e.g. in classrooms, courtrooms and chaired meetings. This means that who may speak, when, and about what topic, is regulated by the institutional rules. Here the range of opportunities and options for action, available in everyday conversations, are reduced and specialized by convention or by legal constraints (Drew & Heritage, 1992).

3.3.3 Ethnography of communication

A related approach is based in anthropology and has a concern for holistic explanations of meaning and behavior, and how these have deep roots in culture. As described by Schiffrin (1994), Dell Hymes proposed a focus on communicative competence challenging Chomsky's (1965) explanation of competence as abstract rules of language. Hymes meant that communicative competence, besides knowledge of abstract rules, includes psychological, cultural, and linguistic knowledge governing appropriate language use, e.g. how to engage in everyday conversation as well as in culturally constructed communicative events. That means knowing not only the language code à la Chomsky (1965), but what to say to whom, and in what manner in any given situation (Saville-Troike, 1982). Instances of communication events are never free of the cultural belief and action systems in which they occur, i.e., the way we communicate is part of our cultural repertoire for making sense of, and interacting with, the world (Schiffrin, 1994).

One of the main social functions of language is to create/reinforce boundaries, i.e., unifying its speakers as members of a speech community.

At one level ethnography of communication deals with *communicative functions* similar to those of speech act theory: *expressive* (conveying feelings or emotions); *directive* (requesting or demanding); *referential* (true or false); *poetic* (aesthetic); *phatic* (empathy and solidarity), and *metalinguistic* (referring to language itself). There is however a big difference in scope, while speech act theory generally excludes the metaphorical and phatic use of language, these constitute the major focus for ethnographic description (Saville-Troike, 1982).

The focus of ethnography of communication is on the *speech community*, and the way communication is organized within this community. As any definition of *community*, there is a dimension of shared knowledge, possessions or behaviors. A speech community may range from languages with limited distribution (e.g. Mongolian) to languages such as English with many members having it as a second language. Individuals may thus participate in several discrete or overlapping speech communities.

In ethnography of communication there are basically three units of analysis: *communicative situation*, *communicative event* and *communicative act*. The communicative situation (cf. speech event) refers to the context or institutional setting within which the communication occurs, e.g. a court trial, a religious ceremony, auction, train ride etc. The *communicative event* is the basic unit for descriptive purposes. A single event is comprised by a unified set of components throughout, the same general purpose of communication, the same general topic, the same participants, and the same rules for interaction, in the same setting. Discovering what constitutes a communicative event, and what types of events (i.e. culturally defined categories) that are recognized within a speech community is part of doing ethnography of communication. The *communicative act* is a single interactional function, e.g. a request, a demand etc.

3.3.4 Interactional sociolinguistics

Linguistic anthropology provided an understanding of how people may share the grammatical rules but contextualize what is said in different ways. Language is viewed as a symbol system that is socially and culturally constructed. It both reflects and creates macro level social meaning and micro level interpersonal meanings (Schiffrin, 1994). Drawing on Mead's ideas on the formation of the self (1934), the sociologist Erving Goffman (1959) viewed the self as a social construction, or more specifically, an interactive construction.

Goffman provided descriptions of how language is situated in particular circumstances. He focused on situated knowledge, the self, and social context, and provided a social framework for describing and understanding the form and meaning of the social and interpersonal contexts that provide presuppositions for the interpretation of meaning.

The work of Goffman focuses on how the organization of social life in institutions provides contexts in which behavior and communication with others can be made sense of.

Interactional sociolinguistics focuses upon situated meaning, it views discourse as a social interaction in which the emergent

construction and negotiation of meaning is facilitated by the use of language. Language does not just function in context, but also forms and provides context.

3.3.5 Grice's maxims of conversation

Grice argued that general maxims of cooperation makes it possible to infer the speakers' communicative intention. The hearer supplements the literal meaning with inferences based on assumptions of human rationality and cooperation, i.e., generally we do cooperate when we communicate. We want to be understood, and as listeners we assume that the speaker wants to be understood.

This leads to the notion of *conversational implicature*, proposed by Grice (1975). Grice suggested that there is a set of overarching assumptions guiding the conduct of conversation. These rise from basic rational considerations and may be formulated as guidelines for the efficient and effective use of language in conversation (Levinson, 1983). Grice identifies as guidelines of this kind, four maxims of conversation or general principles underlying efficient cooperative use of language (Grice, 1975). Together these principles express a general cooperative principle, and specify what participants must do to converse in a maximally efficient, rational, cooperative way:

- (i) The maxim of quality**
Make a contribution you believe is true, i.e., do not say what you believe is false, or for which you lack adequate evidence.
- (ii) The maxim of quantity**
Make your contribution as informative as is required for the purposes of the exchange, and do not make your contribution more informative than is required.
- (iii) The maxim of relevance**
Make your contribution relevant.
- (iv) The maxim of manner**
Be perspicuous and avoid obscurity, avoid ambiguity, be brief, and be orderly.

(v) **The cooperative principle**

Make your contribution such as required, by the accepted purpose or direction of the talk exchange you are engaged in.

Assuming that people obey the maxims, they generate inferences beyond the semantic content of the sentence uttered, i.e., conversational implicatures. These inferences are based on both the content of what was said, and the specific assumptions about the cooperative nature of ordinary verbal interaction. Like speech act theory, Grice's ideas emanate from language philosophy and is a theory not founded in empirical investigations.

3.3.6 Habermas' theory of communicative action

Habermas criticized speech act theory, on basis that it overlooks the orientation of the participants, i.e., that the hearer accepts the validity of the speaker's claims. If the validity claims are not accepted, the communication has not failed but could continue by negotiating the validity claims. The alternative theory developed by Habermas, *the theory of communicative action*, introduces the distinction between *strategic action* and *communicative action*. In strategic action people strive after their private goals, while in communicative action the participants strive for mutual agreement (Habermas, 1984).

The basic condition for communicative action is that the participants achieve a common understanding of the situation in which they find themselves. To do this they must share the same validity claims. In any speech act the speaker raises three claims, a claim to truth, a claim to justice and a claim to sincerity. The propositional content of a speech act could be divided according to three worlds of reference: the objective world, the social world and the subjective world. If the hearer agrees on all three validity claims, the speech act succeeds.

The *perlocutionary effects* belong to the realm of strategic action, thus communicative action requires that the participants only have *illocutionary goals*.

Habermas makes a different classification of speech acts, with only one dimension related to the dominant claim put forward by the speaker.

- *Imperativa*, e.g. “Shut up”, “Go away”. The speaker aims at a change of state in the objective world, and attempts to let the hearer act in such a way that this change is brought about. Dominant claim is the power claim.
- *Constativa*, e.g. “It’s raining”, “There is a car on the street”. The speaker asserts something about the states of affairs in the objective world. The dominant claim is the claim to truth.
- *Regulativa*, e.g. “Close the window please”, “I promise to move the car”. The speaker refers to a common social world, in such a way that he tries to establish an interpersonal relation, which is considered to be legitimate. The dominant claim is the claim for justice.
- *Expressiva*, e.g. “I apologize for being so crude”, “I congratulate you to becoming a professor”. The speaker refers to her subjective world in such a way that she discloses publicly a lived experience. The dominant claim is the claim for sincerity.

3.4 The language-action approach

The research community within informatics, that is mostly related to the view on communication as action, is the Language-Action Perspective (LAP). In this section research related to LAP will be discussed. It is important to point out however, that this thesis will not fit completely into LAP as it is currently viewed. This is due to the circumstances that mainstream LAP-research is not devoted to issues of effects on individuals, groups or organizations, but rather taking a quite mechanistic stance in its worldview. Searlian speech act theory will provide an appropriate foundation for design, if the aim is to develop a formal theory, or a formal language to describe and implement communication. However, people's communication and work practices are not easily addressed by such formalizations. The real problems occur on another level of abstraction. Thus, there are many inherent problems in LAP as discussed in *paper one*. Still, LAP is interesting and important in many ways. The main point, the shift of focus to communicative action as a foundation for design, is of great importance. LAP is also one of the best examples of the exploitation of linguistic theories for IT-design.

“The greatest impact of alternative linguistic models on IT has been that of Austin's theory, as elaborated by Searle and evangelized by Winograd & Flores (1986).” (Whitaker, 1992)

LAP has made a considerable contribution to the representation of organizations and action. It has also had quite an impact on ideas, methods and thinking about rationalization of business processes (Keen, 1991; Ciborra, 1993). The impact spans from basic views on business processes and customer focus, to design of software, modeling of processes and communication in organizations, tools to support this modeling, to formal languages based on speech acts. Examples on the use of speech act theory as a foundation for formal languages to be used in, e.g., agents are found in (Verharen, 1997)

LAP seems to have an inherent power to provoke compared to other approaches in IS-research. It has for a long time been debated and criticized, and it is still controversial (Bullen & Bennet, 1996; Robinson, 1991; Suchman, 1993; Winograd, 1994; Bannon, 1995). The critique of LAP is summarized and extended in *paper 1* and the few examples of empirical research related to LAP is summarized in *paper 3*. In this section research related to LAP will be discussed in terms of basic concepts, methods and tools.

3.4.1 Basic concepts

The starting point of LAP in the IS-field goes back to the work by Flores and Ludlow (1980). Winograd & Flores (1986) then argued for a “new foundation for design”. At the time most office models were information-based, i.e., viewing an office as a network of stations through which forms or other information objects flows (Auramäki et al., 1992). The new foundation for design meant a shift in perspective: that people not mainly process information and make decisions, as believed in the predominant perspectives, but that people do things through language, i.e., they act by using language (Winograd, 1988). Systems design should address these acts and doings, leading to designs that support people to do what they are committed to. Instead of e.g. decision support, managers need tools supporting conversation and commitments.

The set of concepts, methods and products denoted by LAP may be seen as the forming of a new *communication paradigm*. As such these ideas have had a great impact on the research community, both directly and indirectly.

LAP is founded on Searle’s speech act theory (see section 3) and illocutionary logic, i.e., the formalizations of speech act theory made by Searle and Vanderveken (1985).

The first important idea in LAP is that *language is the primary dimension* of cooperative activity. Action is performed through language in a world constituted through language. This means according to Winograd & Flores, that the design of IT should have a focus on *getting things done*, rather than the mere storage of data. The act of doing something, the recurrent patterns of

3.4.2 Early tools for conversation

Winograd & Flores (1986) proposed the idea of tools for conversations, as a new and more promising instrument for management. The most well known system from the first generation of “conversational systems” was *the Coordinator*. The Coordinator provided facilities for generating, transmitting, storing and displaying messages (Winograd, 1988). It also kept track of messages as moves in a conversation. It was thus possible to trace a conversation backwards, and to keep track of commitments and obligations to others and vice versa. One point here was to use the computer to deal with structure and let people make the interpretations of the text. When a user receives a request, she can respond according to a menu automatically generated by a conversational state generator. According to the recent state in the conversation, a new menu is generated. Thus, the type of speech act that is possible to perform is explicitly represented in the system. To open a conversation for action, there were two possibilities: *request* or *offer*.

<i>Acknowledge</i>	<i>Promise</i>
Free-Form	Counter-Offer
Commit-to-commit	Decline
Interim-report	Report-completion

Figure 3. Menu options for responding to a request (Winograd, 1988)

This explicit representation, based on a fixed set of speech act categories generated some critique. Suchman (1994) criticized the disciplining nature of categorization; i.e., to impose a typology on the users instead of using the practitioners own categorization.

Several studies also showed that the Coordinator was heavily used and appreciated by the users, but as a mail system (Schäl, 1996). Only a few persons used the core capabilities. Regardless of the content of the message, people sent each other requests, i.e., they just chose the first item on the menu (Bullen & Bennet, 1996).

CHAOS was the most notable LAP-based system besides the Coordinator. The theoretical base was similar to that of the Coordinator, but was founded on Petri nets (De Cindio et al., 1988). Further work resulted in the Milan conversation model (De Michelis, 1994). The Coordinator and ***CHAOS*** were software tools for conversation, based on speech act theory. Other related work on LAP was more oriented towards modeling communication in offices and organizations.

3.4.3 Modeling organizational processes and office communications

One early attempt to use speech-acts to model organizations and offices was ***SAMPO***⁴, an action-based office development methodology, providing a communication-oriented model of offices that ties together the purpose and structure of office communication (Auramäki 1988; Auramäki et al. 1992). An office is regarded as a social activity. Trying to understand the nature of this social activity requires a theory of language and its use. This is achieved by introducing speech-act theory and discourse theory providing a communication-oriented model of offices. Offices are viewed as networks of commitments, which are created and maintained in organizational discourses. By reconstructing and understanding the rules that govern communication, the method could support the redesign of these rules.

- description of the purpose of the communications;
- description of the conditions for successful communication
- emphasis on guaranteeing the understandability of communications;
- emphasis on guaranteeing the coherency and completeness of communications;
- simultaneous analysis of communication and organizational tasks;
- balanced design of the organization and the IS.

Figure 4. Features of ***SAMPO*** (Auramäki et al. 1992).

⁴Speech-Act Based Office Modelling Approach

The aims of SAMPO were to model office communications, and provide methodological support for the information systems specification phase. SAMPO views any information system as a social, linguistic system for communication between people.

The conversation for action schema and ideas behind early LAP efforts such as the Coordinator and CHAOS have during the nineties evolved into a general base for design of business processes. A set of methods and products has emerged that use a modeling language similar to the one proposed by Flores et al. For each task there is a workflow, which includes the communication with the customer, according to the schema of conversation for action. Worker accountability and customer satisfaction is made explicit. This is illustrated as a circle with four phases, as is illustrated in figure 5 several circles can be connected with links. The idea is that a speech act in one workflow may trigger a speech act in another workflow. One workflow can be viewed as a sub flow to another workflow. This basic loop may be seen as a generalization of the conversation for action schema.

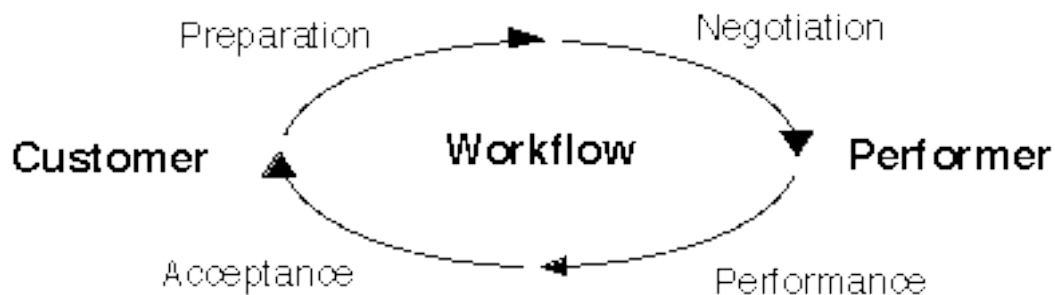


Figure 5. The basic workflow loop (Medina-Mora et al., 1992).

More recent approaches to modeling of business communication by means of language-action, is the Business as Action Game Theory (BAT) proposed by Goldkuhl (1995; 1996). Compared to the Action Workflow approach, The BAT framework is used in a more free fashion in modeling, and not strictly imposed as in the Action Workflow approach. The action diagrams of BAT also explicitly distinguish between material flows and information flows, and between actions and action objects. It is worth to notice that Goldkuhl

was also involved in the very early contributions to the language-action approach (Goldkuhl and Lyytinen, 1982).

3.4.4 Alternative approaches

The LAP-approach is founded on Searlian speech act theory. One problem with this is the rigid view on processes as pre-planned sequences of speech-acts, which could be described and designed without regard to context and the situated character of work tasks. This rigid view is inherent in speech act theory. Conversation analysis and ethnographic approaches to communication takes the complex, situated character of language use in to account. Such a local perspective on communication has also been used as a base for design (Suchman, 1987).

Attempts have been made to overcome some of the mentioned deficiencies by synthesizing the Language/Action perspective with other approaches, e.g. ethnomethodology (De Michelis & Grasso, 1994), participatory design (Kensing & Winograd) and conversation analysis (Bowers & Churcher, 1988, Holm & Ljungberg, 1996).

One line of criticism has been based on the theories of Habermas (Dietz, 1991; Dietz and Widdershoven, 1992). The Searlian speech act theory only focuses on institutionalized ways of communicating sincerely. It fails to describe how people manipulate each other. Habermas, on the other hand, takes also this into account. While Searlian speech act theory only focuses on communicative action oriented towards mutual agreement, it fails to describe how people manipulate each other, in strategic action. Habermas (1984) also considered strategic action, i.e., when participants strive for private goals. Dietz and Widdershoven (1992) propose that the notion of speech acts is replaced by the notion of exchange of validity claims, and that focus should be on regulativa. With an orientation towards mutual understanding, one does not need requirements of shared interests, and stable role structures.

The *COSMOS* project aimed at an integration of technical and social perspectives in the design and development of communication systems (COSMOS 1989; Bowers & Churcher 1988). By using work and ideas from Conversational Analysis as a

basis, instead of speech-act theory, it was claimed that CSCW systems supporting conversational as well as non-conversational actions could be designed. Locally managed conversation is complemented with a global management (structuring), non-conversational perspective on practical activities. While the *conversation for action* schema takes a prescriptive view of appropriate forms of social behavior, COSMOS takes a more flexible view on communicative practice.

COMMODIUS is a slightly different method of speech act modeling, where the functional role of the automated information system is included in the model. The system may function as a performer of speech acts, as an instructor, or as a passive communication media. This is based on an extended version of the underlying generic schema for conversation for action, where the schema is used in a more flexible way (the speech act sequence is editable). Information content for each speech act is modeled, together with rules guiding the software behavior in support functions, e.g. where the system should instruct the user. The basic idea is to produce an abstract model of organizational communication

3.5 The role of language in organizing

Since the 1980s there has been an increased interest in interpretive and cultural approaches to organizational communication (e.g. Mumby, 1988; Putnam & Panakowsky, 1983). The construction of organizational reality, through utilization of linguistic and cultural representations (or language games), has here become a central concern (see e.g. Gergen, 1992; Reed & Hughes, 1992).

This move can be seen as a *linguistic turn* in organization analysis, where the role of language as a socially and culturally constructed symbol system, is seen as central to organizational action and organizing. Inherent in this linguistic turn is that communication is grounded in action, not in information transmission. Conversations among organization members are

continuously shaping and reshaping social structure, i.e., creating organizing (Mumby, 1988; Boden, 1994).

“Communication is thus not simply the vehicle for information, but rather is the very process by which the notion of organizing comes to acquire consensual meaning. Organizing is therefore continuously created and recreated in the act of communication among organization members” (Mumby, 1988, p. 14).

Meaning is thus not transported through communication as in the pipeline models of communication (Shannon & Weaver, 1949), but meaning is produced in interaction and communication (Mumby, 1988). Meaning is thus, neither the product of individual interpretation nor an objectively existing entity outside of social interaction.

With the recent trend of narrative approaches (e.g. Czarniawska, 1997) to institutions, and the interest narrative interpretations of organizations, we could as well talk about a *literature turn* in organization theory.

4. Research approach

4.1 Theoretical trajectory

4.1.1 The interdisciplinary transfer of theories

The discipline of informatics is to its nature interdisciplinary, importing and utilizing theories from different areas. Which ones that are relevant, is disputable, but computer science, linguistics, philosophy, organization theory, management, sociology, psychology and social psychology are common sources.

In the work with this thesis, theories and experiences from linguistics as well as from language philosophy has been central. Work in organization theory and organizational communication has been influential.

Importing theories from other disciplines brings with it several problems. It requires a huge intellectual investment for IS-researchers, trying to understand research traditions and theories from several loosely related areas. This is a risky investment, since there is no guarantee for a real contribution, except for a long reference list.

Another problem is that these theories seldom are oriented towards design. While engineering doesn't take the use of technology into account, the social sciences have a tendency to describe human behavior as if it went on without the aid of technical artifacts (Dahlbom, 1996). Unlike the humanities and social sciences with their interests of understanding what has taken place, we are interested in what is to come.

There is also the risk that a theory imported from another field may be outdated and highly criticized in its own field. This problem may however be overruled by the fact that a theory imported to informatics will be adapted rather than adopted. It will be utilized with another aim, e.g. with a design-oriented purpose.

Assessing a theory's usefulness for informatics and its applicability in design, need not be related to the status of the theory

in its own field, i.e., if it is seen as “true” in the source discipline. Rather it is how usable it is in the new context that counts. A theory exported to a new field often serves new purposes and should be evaluated on new grounds, it will also certainly undergo adaptations, when applied in its new field. This is not to say however, that it is irrelevant to critically examine the background of imported theories.

One example of this, is how Searlian speech act theory and discourse analysis has been used in IT-design, as discussed in *paper 1*.

4.1.2 Theories in Informatics

It's not very controversial to say that the field of information systems is theory poor. This might not be surprising for such a young discipline, with such a broad scope and no common definition. It is also a question of what counts as a theory.

When Langefors founded the discipline of information systems in Scandinavia in the 1960s, he was searching for a theoretical foundation for the analysis and design of information systems – systems development. But “he realized that, to a large extent, he had to develop that foundation himself” (Dahlbom, 1993, p. 14).

With the notion of *information systems*, Langefors wanted to direct the attention towards the use of that system in the organization, to the contextual use of the machine (Ehn, 1995).

Over the years information systems became more narrowly understood as database systems. A large part of the discipline was focusing on the design of databases and the structuring of data. Research efforts were focused on structured methods and method development. This gave a narrow and normative character to parts of the discipline, devoting little efforts to the refinement of its conceptual aspects.

In Langefors' theorizing there were two overlapping conceptions of systems development as a research discipline: systems theory and the idea of a general science of information, “informatology”. Viewing information systems as systems made it natural to turn to systems theory, but there was no theory available

to simply apply to this new area. This led to the formal mathematical theory of systems analysis presented in *Theoretical Analysis of Information Systems – THAIS* (Langefors, 1966), and later, in the 1970s he formed the infological approach, formulated in the infological equation.

Systems theory in its various forms has been one of the most influential theoretical perspectives in informatics (e.g. Checkland, 1981). There have been both hard systems thinkers, taking their departure in engineering, viewing a system as a machine, and soft systems thinkers viewing it as an organism. The machine can be understood by taking it apart in its smallest units, the organism is often viewed as a holistic entity with emergent properties.

Besides cybernetics and systems theory, cognitive theory has dominated parts of informatics (and associated disciplines) in areas like decision support systems, expert systems, artificial intelligence, and human-computer interaction (see Holm and Karlgren, 1996 for a critique).

All the mentioned approaches are rooted in the *modern* science ideal, where theories are expected to give a true account of an objective world. The methods set out to picture the reality in organizations, to map this reality to database design and conceptual schemes.

Gergen (1992, p. 211) characterizes modernity as a “revival of Enlightenment beliefs in the powers of reason and observation”; as a *search for fundamentals* (e.g. atomic particles); as a *faith in progress* (by scientific gains of knowledge the future can be steadily improved); and finally as the absorption in the *machine metaphor*, a model that stresses systematic (causal) relationships between basic elements.

These presumptions are, according to Gergen, represented in approaches such as scientific management theory, the various variants of General systems theory, cybernetic theory, and cognitive theory among others.

The ideas of objective truth, system, and structure are, together with the other principles of modernity, disputed in the postmodern discourse. Here, research, theory and knowledge are assessed in relation to their relevance and practical value.

Qualitative research methods like ethnography is appreciated, and the function of theories is not derived from their truth value, but determined by their pragmatic implications.

“...the primary ingredient of theory is not its data base but its intelligibility, and the very communication of this intelligibility already establishes grounds for its utility. Theory and practice are inseparable.” (Gergen, 1992, p. 217)

At first sight many of the work and activity oriented approaches to information systems development in the CSCW-area, like participatory design, and the Scandinavian school seem to have an inherent antipathy to theory. But perhaps the work and activity oriented approaches in the CSCW-field could be seen instead as “postmodern” in the sense mentioned above. For the Scandinavian school, the aim of research was to improve practice.

Workplace studies have the primary role to “convey the importance of the sociality of work by shedding light on the complex actions and interactions that occur” (Plowman et al., 1995). This is however, not totally unproblematic. Like in ethnographic approaches, the situated nature of work is heavily emphasized, leading to a view on abstractions and generalizations as misplaced or harmful to make.

4.1.3 The need for new theory and new conceptualizations

Doing theoretical work need not be, and ought not to not be aimed at developing grand theories. Developing a rigorous discipline based on an axiomatic set of concepts may lead to an esoteric field without influence or value for practice.

The postmodern fragmentation or eclectic view on theory (intellectual promiscuity) seems more fruitful.

What is needed are useful new concepts to point out new ways of thinking about design and the use of information technology, new metaphors and theoretical frameworks to describe, and analyze the use of information technology for individuals, groups and organizations.

“The biggest advances will come not from doing more and bigger and faster what we are already doing, but from finding new metaphors, new starting points.” (Winograd, 1997, p. 155)

Examples of such new conceptualizations to understand the use of IT-artifacts, are *tinkering* or *bricolage*, i.e., applying known tools and routines in new innovative ways to solve new problems (Ciborra, 1993). Other examples are *hostility* and *care* (Ciborra, 1996). Yet another good example is the use of actor network theory, to understand and develop infrastructure and standardization (Hanseth, 1996).

The theoretical contribution of the thesis, consists of a framework of concepts intended to improve the analyze and design of information technology use, especially in the context of communication and communicational work.

Examples of such conceptualizations are the notions of *discourse* and *conversation*, which are used to represent the essentials of two different ways to view communication processes. As described in paper 2, these notions capture two aspects of human activities and communicative conventions.

Discourses are typically viewed as a sequence of coherent communicative acts, with *globally* managed *rules* regarding sequence, who may perform them, and when etc. They are analyzed *theory driven* and top down, and may be associated with well-defined organizational rules that restrict and control the activities.

Conversations, on the other hand, are viewed as a set of *situated* synchronous communicative actions performed at a particular time. They are *locally* managed by the involved participants, governed but *not controlled* by social conventions. They are analyzed *empirically* and bottom up, and may be associated with situated performance of activities in unique situations, requiring a certain amount of skill and responsibility.

Another example is the use of genre analysis and its associated concepts as a way to analyze and understand communicative praxis as discussed in *paper 5*.

4.2 Design oriented trajectory

When the academic discipline of information systems was founded in Scandinavia by Börje Langefors in 1960s, the name was *Information Processing, especially the methodology of administrative data processing*. This name implies that it is a discipline dealing with more than a machine and data, it implies a *contextual use* of the machine for information processing (Ehn, 1995). After a period of focus on describing and structuring data in different notations, the field is now again moving towards an interest in use. In the field of informatics we are interested in the use of IT-artifacts by individuals, in groups, organizations and society. This interest in use, is design oriented, because we want to change and improve the use (Dahlbom, 1996).

Consider the definition of the chair at Göteborg (which were formulated before the department changed the name to Informatics):

“Administrative data processing is a design oriented study of information technology use aiming to contribute to the development of both use and technology.”

Part of the interest in use of IT-artifacts is future oriented, we want to come up with new ways of using the information technology.

An important aspect of all this, is that with the increasing use of information technology in work processes, designing IT means at the same time designing work. With the increased use of standard software, the software vendors are designing work. In many business areas this is a problem, since the vendors seldom understand the characteristics of modern work processes and organizations (Fors & Sandberg, 1997).

“The companies that drive innovation will not be those that focus narrowly on technical innovation but those that deal with the larger context in which the technologies are deployed. (Winograd, 1997, p. 156)

Informatics differs from other disciplines in the humanities and social sciences, in its design orientation. In theoretical as well as empirical work, this design orientation is present. In the papers this design orientation is manifested in various ways.

In *paper one* general questions of how theories can inform design is discussed, and specifically the potential consequences of using speech act theory for design is addressed. *Paper two* presents design guidelines, and a set of metaphors representing the role of the information system in different use situations. *Paper three* presents a framework for reflection when designing work processes with information technology. In *paper four*, there is a general discussion about design of work with information technology. *Paper five* discusses the potential use of genre theory in design of support for communication.

The design-oriented contribution could be seen as a set of design concepts and guidelines forming a “method“ or a *framework* of concepts, including:

- a set of ideas from discourse and conversation analysis, to be applied in analyzes and design of communication processes (paper 2);
- metaphors for illustrating the functional role of IT-artifacts when supporting human actions;
- a framework to be used as a basis for reflection, and to make the span of routinization versus flexibility more visible when designing e.g. workflow systems (paper 3).
- an application of genre analysis to understand genres of organizational communication, to improve use of communication technology.

4.3 Empirical trajectory

The theoretical work has been informed by empirical findings. An explorative case study was carried out in two different organizations,

focusing on computer support for ordering processes. The first site was a large university library, and the second site was a company in the computer business. At the library the study concerned a traditional database system, i.e., a standard library software package, primarily supporting communication with external customers and managing the lending process. At the computer company the study concerned a speech act based workflow management system, mainly supporting communication within the firm, i.e., coordinating the different roles in the ordering process, e.g. sales, warehouse, distribution, installation and consultants.

The design of the case study is described in (Ljungberg & Holm, 1995) and the full results are presented in (Holm et al., 1996). *Paper three* is discussing the results from the computer firm. *Paper four* is based on material from the library and the computer firm, as well as an earlier case study (Bradley & Holm, 1992). The design example in *paper 2* is based on the lending discourse from the library case, which also inspired the use of the concepts *discourse* and *conversation*.

The main question of the case study was: When is it appropriate to apply a speech act perspective, and when not? In what ways should one extend the speech act approach? The main goal of the study was thus to make general reflections on the applicability and consequences of the speech act based approach. This discussion also includes more general considerations regarding the organizational effects of introducing the studied systems, their major advantages and disadvantages.

4.3.1 Case study design

Data was mainly collected by interviews and reading of documentation with some additional observations of systems in use. The study consisted of eleven (five in case one and six in case two) semi-structured interviews, with representatives from management, systems developers, and users. We chose people working with different parts of the ordering procedure. The interviews took one to two hours and were then recorded and typed.

In addition to interviewing staff we read various documents. In the library case we read a user manual for the system, a pamphlet specifying rules for loans, a form for reporting and investigating lost books, standard letters to be sent to customers, and the latest annual report. In the workflow management case we read documentation of the workflow system, brochures about the firm and their product catalogs. In both cases the systems were demonstrated to us, together with other software systems used in the daily routines.

The questionnaire was structured as follows:

- A) Questions about the interviewee**
- B) Questions about the history and background of the system**
- C) Detailed questions about work routines and system use**
- D) Questions about the character of work routines and system use**

The second group (B) typically contained questions like: When was the system developed? What was the major motivation and vision in building the system? Who initiated the development project? Who participated in the development? The third and fourth group, (C) and (D), typically contained questions like: Were there any major problems when introducing the system? Were there any changes in work practice when the system was initiated? Did the communication become more or less controlled? What were the changes in work roles for the users? What are the major advantages and disadvantages with the system?

We selected the interviewees so that we included a management representative, staff responsible for developing and/or maintaining the system, and system users. We also wanted subjects working with as many different subroutines as possible.

4.3.2 The library

The library case focused on the loaning procedures within Stockholm University library. It is one of the largest libraries in northern Europe, with about 130 employees. The last years have been characterized by an increasing utilization of the library's services. In almost every sector: loan, remote loan, literature

searching, education, purchase, new media, catalogue et cetera, the library shows increasing figures. Despite this increasing workload, the number of employees have remained constant for the last ten years. Due to changes in the economical-administrative control and steering, the possibilities to get economical compensation for the increased exploitation of library services have been reduced. Due to hard work of the personnel, and some extra financial help from the faculty, the quality has more or less stayed at status quo.

The rapid progress of new information technology and infrastructure the last decade are reshaping the conditions also for the library. Many of the basic characteristics of library service and library work are beginning to change.

This development could be viewed both as a threat and an opportunity. It is a threat to the way work is done at the library today, but it is an opportunity for the library to expand its role to new services and media.

The people

During 93/94 10 people (sharing 4 full time appointments) have been working with computerization matters. The computer unit consisted of one computer professional (systems developer), one systems librarian (both full time), and one maintenance responsible for the local system (working half time). 6 librarians from faculty departments also worked at the computer unit (corresponding to 1,5 full appointments) with operation of the GEAC-system together with the computer systems for outer service and at the departmental libraries.

The library is organized in four managerial functions: the library board, the MBL⁵-group, the chief librarian and the management group and there is also a computerization group. The rest of the library is organized in eight groups. There are four faculty groups: mathematics and natural sciences, the humanities, the social sciences and law. Within each area there are people responsible for purchasing and classification of books. The loan desk administration forms a group of its own. It consists of about 25 people, of which most are students that work extra at the library. Still another group

⁵ the act on employee participation in decision-making

administers literature used at various courses at the university. Moreover, there is a group with administrative staff, a group for book care, and a group in charge of book deliveries. The faculty groups (except law) are also responsible for a number of faculty department libraries.

The information system

The core of the library services is to manage the collections of books and periodica, and administering loans. In the beginning of the eighties these tasks became hardly possible with manual routines, due to constantly increasing numbers of customers and loan rates. The manual routines for administering customers and their loans were slow and inaccurate. They included manual filing of receipts and there were two and a half appointments only for putting cards in the card catalogue. To deal with this situation a standard library system was bought (GEAC) in 1985, to manage the collection of books and periodica and the loan transactions. The system is a standard library system, and it has some standard routines and standard categories of books. It has also a set of standard categories of users or roles built in. The system consists of a loan module and a cataloguing module. The loan module administers activities such as loan, re-loan, return of books, different kinds of fees, customer contracts (library card) and loan terms et cetera. The system was updated in 1990 to have more capacity.

4.3.3 The computer firm

Beta in Gothenburg, Sweden is a company targeting on providing complete IT solutions for businesses. This means providing everything from telephone systems to scheduled classes on how to use common application programs. The company is part of the Beta group, the country's largest chain within its field of business.

Being a complete solutions provider for companies means Beta has to constantly research the market, test new products, and work on building competence within the company. The people at Beta, as well as their customers, are faced with rapidly evolving technologies, but also new ways of thinking about work and

communication. Beta is a company working with visions as much as today's reality. As a company they analyze the IT market and select products they believe will be most conducive to the success of today's companies, and will help them stay competitive in the future.

Naturally, being an IT provider, Beta itself benefits from its own use of IT. The products they sell are the same products they use, and the competence needed for using these is sold also. Beta, must in order to stay in business use tools that work and they must test solutions for tomorrow in order to be ready when demand rises for such products in the future.

The people

Beta in Gothenburg has a little less than forty employees. It is an organization emphasizing teamwork, but also personal autonomy, i.e., employees must be able to work alone as well as in teams. The firm is organized in seven areas: sales, consulting, service engineering, warehouse, administration, education, and systems development. People may very well work in more than one of these areas.

Sales or *in-house sales*, is responsible for taking orders and selling products over the phone. They also administer deliveries from suppliers, monitor and supervise orders. They rely heavily on stock, price and product information available through a Lotus Notes System. After selling a product other groups like consultants, service engineers or educators might get involved to satisfy the customers needs related to the product. Thus, selling a product involves coordination among several groups, including suppliers who usually deliver directly to the customer. The in-house sales process is the most production oriented routine process with a very high work tempo.

Consultant functions as a combination of *out-of-house sales* and consulting. They visit customers and potential customers, helping them to develop their business in ways they want. Thus, they try to see potential improvements of the customers' service or processes by new technology. They are not selling "things" as in-house sales does, but solutions and improvements of the customer's organization. Their work is based on deep relations and frequent

interactions with the customer. A large customers may have a person from consulting mainly devoted to their business, spending most of their time at the customer's site, developing over time a considerable knowledge about the customer's business, and a deep commitment to improve it.

Service engineering helps customers with installation and configuration upon delivery. The *warehouse* staff manages the inventory, and in specific circumstances they take orders directly from customers calling directly to the warehouse. The *education group* sells courses and does demonstrations of certain systems. *Systems development* is developing applications for internal use in the company.

The information system

In this study we examine Beta mainly with respect to their ordering procedure, in connection with its traditional systems, as well as two new technologies: Lotus Notes and Action Workflow. Existing applications in Lotus Notes covered: price and product information; delivery information; order generation; installation requirements; stock status; delivery date/time;

Action workflow was used as a means to:

- Analyze work in terms of a global process oriented view;
- Prepare for a future integration of Notes applications;

While much of the Lotus Notes Systems have been built, and are being used in parallel with several older systems, the Action Workflow system is not yet implemented. Several important aspects of the company's ordering procedure has been modeled, however, and the aim is to build a global workflow management system that will tie together all parts of the ordering procedure.

Apart from Lotus Notes and Action Workflow technology, the company also relies on more traditional systems and methodologies, such as electronic manuals and handbooks, protocols from meetings, scheduling, databases, administrative systems and customer relations' support systems.

Some of the traditional systems have indirect links to certain Notes applications since data is manually copied between these by workers in the administrative department. The staff in this department is thus administrators of systems with redundant information and spends considerable time keeping this redundancy up to date by mirroring certain information. Other personnel benefit from this since they are given one easy-to-use technology: Lotus Notes. This simplicity does not come for free, however, and while the general consensus is that the mirroring should be automated, no such routines are available at the time.

5. Results

5.1 The papers

Speech Acts on Trial

The role of speech act theory as a foundation for design of information technology has been vividly discussed and criticized in the CSCW-area. The first paper addresses the applicability of speech act theory as a theoretical foundation for design of information technology. The different limitations of speech act theory in the context of design are categorized. Special attention is paid to the adaptation speech act theory has undergone when applied in the IT-field. One question concerns what happens when we import passive descriptive theories from other disciplines and use them as a basis in active design. The basic standpoint is that speech act theory may be useful, but only if one is aware of its shortcomings. By surveying various criticisms directed towards speech act based design along with extensions and alternative approaches we attempt to pinpoint these shortcomings. The aim is to identify breakdowns of speech act based methods and discuss the need for further adaptation.

Multi-Discourse Conversations

In the second paper the speech act approach is extended with ideas from conversation analysis, in order to overcome some of the criticisms addressed in paper 1. The discourse concept in the tradition of discourse analysis is used to denote routinized and procedural activities in organizations, i.e. as a set of coherent speech acts for which there exist strict organizational rules regarding their sequence, who may perform them, under which circumstances etc. The conversation concept in the tradition of conversation analysis denotes a contingent, situated activity, where the language user is viewed as a competent and autonomous agent, guided by the existing social rules and conventions. The problems with IT-design are interpreted in terms of striving for a balance between efficiency, routinization and global control on the one hand, and empowerment, skill and flexibility for the individual, on the other. Finally a set of metaphors is introduced to illustrate the role played by information technology as a mediator of social rules and conventions.

Information Technology and Organizational Effects

The third paper explores the Language/Action approach by reflecting on an explorative case study from a small Swedish company in the IT-sector. The company is using Lotus Notes™ in combination with Action Workflow™ to increase the efficiency of its sales processes. This includes communication with customers as well as intra-organizational communication between people involved in the sales process. The paper addresses some of the issues raised in the debate about the Language/Action perspective: Does application of the Language/Action perspective automatically lead to control and routinization of work tasks, or could we find other implications? What characteristics of technology and work are important to bring up in a discussion about effects of introducing new technology in organizations? The paper proposes a framework, identifying important characteristics of technology and work, which can be used in discussing effects of introducing new technology to improve efficiency in processes.

Structures that imprison and Structures that Free

In this paper it is argued that there is a need to renew the discussion of the 70s regarding the effect information technology (IT) has on skill requirements, responsibilities and learning in work life. It is also argued, however, that these issues need to be formulated differently today. In its first decades, computerization strengthened rationalization efforts in industry. IT was claimed to increase Taylorism and alienation. As we move into the postindustrial society, the situation is almost the reverse. People no longer discuss “deskilling” and “dequalification of work”. Instead we encounter expressions like “user empowerment” and “the good IT-society”. We now need to reflect on how and when these concerns can co-exist, and how IT can be an enabling factor for their co-existence. By considering three cases, we want to throw light upon what important social and ethical decisions technology confronts us with today, as to how work should be organized.

Organizations and Conversation

In the fifth paper it is claimed that organizations mainly are constituted by communication, and that work is becoming inherently communicative. The question is how we could articulate this view in IT-design. Theories of communication and organization are mainly aimed at understanding and interpreting organizations, and do not address design issues. The most common theories of organization and organizational communication exploited for design is however based on an extremely instrumental/rationalistic perspective on communication. In this paper it is argued that one of the potentially most beneficial concepts to introduce in organizational communication, is a design oriented notion of genre.

5.2 Other publications related to the thesis

Some publications that have served as background material, and have been part of the process of writing the thesis should also to be mentioned:

- 1 Hagman, Johan & Ljungberg, Jan (1995), Brute Facts vs Institutional Facts as a Foundation for IR, in *Proceedings of Fifth European-Japanese Seminar on Information Modeling and Knowledge Bases*, Sapporo, Japan, June, 1995. This paper presents results from cluster analysis of newspaper texts, and discusses the relation between basic statistical approaches founded on “brute facts” of language in relation to “institutional facts” of language, i.e., the institutionalized use of language.
- 2 Holm, Peter, Ljungberg, Jan & Hedman, Anders (1996) Work, Communication and Information Technology: The Results of a Case Study, Report nr. 96-005, DSV, Stockholm University/Royal Institute of Technology, 1996. This is the report that presents the results from the two case studies.
- 3 Ljungberg, J. (1996) *Workflow - State of the Art: Att koordinera och effektivisera arbete med hjälp av IT*, SISU Publikation 96:21, Svenska Institutet för System Utveckling, Oktober, 1996. This is a popular report (in Swedish) describing the basics of workflow technology, its advantages and drawbacks.
- 4 Ljungberg, Jan and Holm, Peter (1995) Work, Communication and Information Technology — On the Design of a Case Study, in *Proceedings of the 18:th Information Systems Research Seminar In Scandinavia*, Denmark, August 11-13, 1995. This paper describes design of the case studies.
- 5 Holm, Peter and Ljungberg, Jan (1997), Combining Multiple Abstraction Mechanisms in Communication Modeling, in *Proceedings of HCI-International*, San Francisco, Augusti, 1997.

5.3 Future work

The future plans are to extend the theoretical framework, and formulate it as a “method” and a set of design guidelines for workflow and communication systems. Part of such an extension is outlined in (Holm & Ljungberg, 1997), where we further explore the design method for workflow systems. The method will then be tried out in a real case, in an organization. This requires some repackaging and clarifications of the approach. We also plan to use our students in an evaluation of the intelligibility of the approach.

The genre concept will be more fully investigated, both theoretically and empirically. A field study is initiated in a large Swedish organization.

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First paper

Speech Acts On Trial

Jan Ljungberg[†] and Peter Holm[‡]

[†] Dept. of Informatics, Göteborg University, Box 3147, 400 10 Göteborg, Sweden
Tel: +46 31 773 2746—E-mail: janl@adb.gu.se

[‡] Dept. of Computer and Systems Science, Stockholm University, Electrum 230, 164 40
Kista, Sweden
Tel: +46 8 16 16 84—E-mail: pholm@dsv.su.se

Abstract:

In this document we discuss the applicability of speech act theory as a theoretical foundation for the design of information technology (IT). We pay special attention to the adaptation speech act theory has undergone when applied in the IT-field. One question we address concerns what happens when we import passive descriptive theories from other disciplines and use them as a basis in active design. The basic standpoint is that speech act theory may be useful, but only if one is aware of its shortcomings. By surveying various criticisms directed towards speech act based design along with extensions and alternative approaches we attempt to pinpoint these shortcomings. Our aim is to identify breakdowns of speech act based methods and discuss the need for further adaptation. This is done by the use of a framework, also presented in the chapter.

KEY WORDS: Speech act theory, Language/action approach, IT design, IT development.

1. Introduction

In the field of IT-design the dominating perspective on IT-artifacts has been an information storage paradigm. Over the course of time, the social and communicative aspects of IT-use have become more stressed. In this process speech act theory has come to play an important role (Auramäki, 1988; Auramäki et al., 1988, 1992a, 1992b; De Cindio et al., 1986; De Michelis and Grasso, 1994; Flores et al., 1988; Kensing and Winograd, 1991; Medina-Mora et al., 1992; Winograd, 1988; Winograd and Flores, 1986). From the early applications in the Co-ordinator, its use has spread to industrial practice in the Workflow management area. The more widespread use of speech act theory has become, the more it has also been debated and criticized (Bowers, 1993; Bowers and Churcher, 1988; CSCW — An International Journal, Vol. 3, 1995; Dietz and Widdershoven, 1992; Suchman, 1994; Winograd, 1994). A part of this criticism is not specifically about speech act theory, but concerns general issues about designing and using IT in an organizational context. There exists a need to create an overview of this criticism. Exactly what is wrong with speech act theory? Can it be adapted to overcome some of the criticisms?

In “How To Do Things With Words”, the posthumously published lectures of J. L. Austin, the view that language is only a means to assert propositions about the world was attacked. Austin recognized that truth conditional semantics was troublesome for certain kinds of utterances that are not descriptive, but rather constitute actions. The saying of certain words changes the world, rather than merely describing it. The failure of traditional semantic theories to deal with this problem he called the descriptive fallacy.

“It was for too long the assumption of philosophers that the business of a ‘statement’ can only be to ‘describe’ some state of affairs, or to ‘state some fact’, which it must do either truly or falsely.” (Austin, 1962, p. 1)

Austin called these special kinds of utterances *performatives* (e.g. baptising, marrying). Related to performative utterances is a special

class of performative verbs (e.g. apologize, criticize, approve). Performatives are not judged to be true or false, rather they are happily or unhappily performed. To be happily performed certain conditions must be fulfilled (felicity conditions), e.g. to give a sentence in court, the act must be performed by a judge.

To say something is, according to Austin, to perform three simultaneous acts: one locutionary act, one illocutionary act and one perlocutionary act. The locutionary act is the act of uttering a sentence with a sense and a reference. Whenever we perform a locutionary act, we also perform an illocutionary act, according to conventions of language associated with the act, e.g. urging, warning et cetera. Saying something will also typically cause certain consequential effects upon thoughts, beliefs or actions of the hearer. Bringing about these effects is to perform a perlocutionary act, e.g. persuade, alarm et cetera. According to Austin, illocutionary acts are conventional, but perlocutionary acts are not. That is, the former could be made explicit by a performative formula, but the latter could not. "I argue" and "I warn you" are possible performative constructions, but we cannot say "I convince you" and "I alarm you".

While Austin's theory was open ended and Platonic, Searle systematized it, made it formal and Aristotelian, with a set of necessary and sufficient conditions, constitutive of a basic categorization of speech acts. He identified five fundamental illocutionary points, i.e., things possible to do through language (Searle and Vanderveken, 1985; Searle, 1969, 1979).

Searle added the notion of indirect speech acts, i.e., a certain speech act could be expressed in a number of ways without reference to explicit performatives. He also based his notion of illocutionary point more on the intentions of the speaker, than on conventionalized meaning, claiming that any analysis of illocutionary acts must capture intentional as well as conventional aspects (Searle, 1979) and the relations between them.

1.1 Communicative Aspects of IT-Use

In the field of IT-design the prevailing language perspective is a referential one. The most fundamental activities of system design are seen as the mapping of a universe of discourse into abstract symbolic models and databases. The “descriptive fallacy” of methods and techniques for IT-design has been attacked by Lyytinen (1985, 1987), and the limitations of these assumptions (also founding prevailing views of artificial intelligence) to generate new kinds of designs, were put forth by Winograd and Flores (1986). A set of methods, techniques and software artifacts has now evolved that may be seen as a kind of “communication paradigm”, in the way Winograd and Flores argued for a “new foundation for design” (Winograd and Flores, 1986). A way to state this impact of speech act theory is found in (Whitaker, 1992):

“The greatest impact of alternative linguistic models on IT has been that of Austin’s theory, as elaborated by Searle and evangelized by Winograd & Flores (1986).”

This new orientation in design is directed towards the development of computer software for organizational communication and action. Organizations are viewed as networks of commitments and undertakings (Flores et al., 1988). The speech act based approach has been explored, discussed, and criticized extensively. Pioneering work was made by Winograd, Flores et al. (Flores et al., 1988; Medina-Mora et al., 1992; Winograd, 1988; Winograd and Flores, 1986) and Auramäki, Lyytinen et al. (Auramäki et al., 1988, 1992a, 1992b).

Several broader views on the design of IT and its role in the context of work, collaboration and communication also exist, e.g. Mechanisms of interaction (Schmidt, 1993, 1994), Co-ordination theory (Malone and Crowston, 1990), and Activity theory (Kuuti, 1994). There are also several approaches focusing on work practice and workers/users influence on the design of new technology and its use in work settings, e.g. Participatory design (Kyng, 1995; Grønbaeck et al., Chapter 8), and the Tools approach (Ehn, 1988).

Other approaches are influenced by sociology and anthropology such as ethnography in system design (Hughes et al., 1994). The work of Blomberg, Suchman and Trigg (Chapter 10) are also examples of this. To these we could add recent approaches such as ethnocritical heuristics (Muller, Chapter 13), and aesthetic aspects (Ehn et al., Chapter 5).

According to these broader views, a pure communicative view of IT-design, as we discuss in this paper, may have severe shortcomings. Still, a communicative or language oriented view, may be rewarding. A large part of work is performed through language, and IT is used to support communicative activities to a considerable extent. Besides speech act theory, several directions in the study of language use and communication are available from disciplines such as linguistics, language philosophy, social psychology, sociology, and anthropology, e.g. social interactionism, ethnography of communication, and conversation analysis to mention but a few (Schiffrin, 1994).

However, we believe speech act theory has played a particularly important role in the context of IT-design. At the same time it appears that it needs to be used with caution and to be adapted for an IT context. Consequently we have set out to investigate how far speech act theory might guide us in design, and to reflect upon what the consequences of using it might be.

To investigate speech act theory as a foundation for design, we must address the boundaries and potential breakdowns it may posit in its new context. In order to interpret and understand these limits, we need a framework going beyond the communicative perspective, giving hints to other aspects listed above. This paper presents such a framework, involving also dimensions that are not covered by speech act based design. The problem at hand concerns articulating communicative aspects of work and IT-use. When we view IT as a mediator and support for communication, how should we then apply communicative theories in modeling and design? When is it appropriate to apply a speech act perspective, and when not? In what ways should one extend it? A natural point of departure for this discussion is the generic schema, *conversation for action*.

1.2 Conversation for Action

The generic schema of *conversation for action* presented by Winograd, Flores, et al. (Winograd, 1988; Winograd and Flores, 1986; Medina-Mora et al., 1992) has widely influenced the areas of Workflow management, Computer supported collaborative work (CSCW), and Business process re-engineering. A conversation is in this approach a co-ordinated, coherent sequence of language acts. At each point in the conversation, there is only a small set of possible action types. The idea is that whenever a task is being performed for a customer there is a generic pattern of speech acts that occurs. The sequence typically starts with a request from the customer, then the performer makes a promise, and reports completion, which in turn may either be declined or declared complete by the customer. A discourse may thus be defined in a state transition diagram (figure 1), where each state transition corresponds to a speech act.

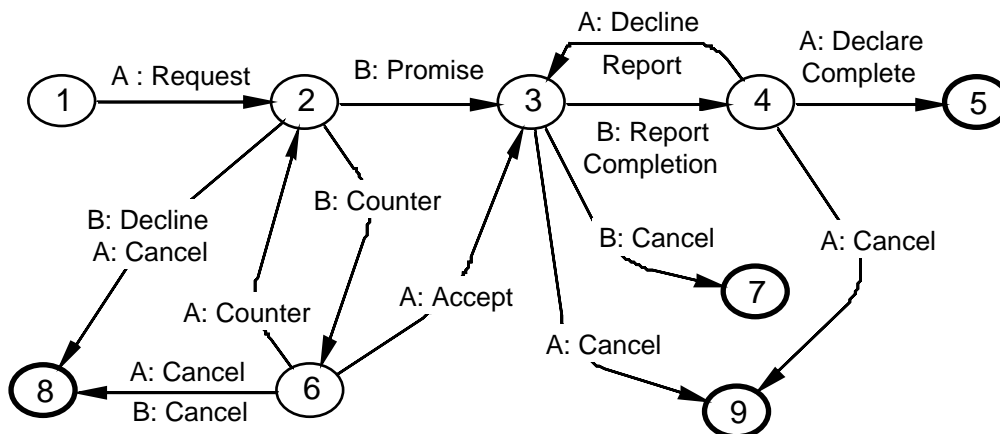


Figure 1: State transition diagram for a workflow

A set of methods and software products, have emerged that use a modeling approach of business activities, similar to the one proposed by Flores et al. For each task there is a workflow, which includes communication with the customer, according to the schema in figure 1. This is illustrated as a basic workflow loop with four phases (figure 2) (Medina-Mora et al., 1992). A work activity is in this view the fulfilment of commitments by a performer to the satisfaction of a customer.

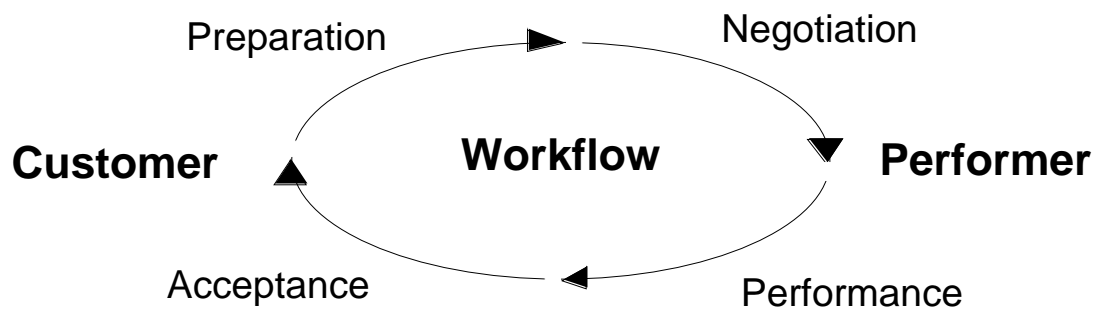


Figure 2: Graphical representation of a basic workflow loop

According to this view, any work activity can be sequenced in four basic steps: *preparation*: the customer makes a request, or the supplier makes an offer; *negotiation*: the parties establish a mutual agreement of conditions of satisfaction; *performance*: the supplier declares that the undertaking is complete, and *acceptance*: the customer declares satisfaction. Several circles can be interconnected with links, such that a speech act in one workflow may trigger one in another workflow. In this way, one workflow can be viewed as a sub flow to another workflow.

The customer/supplier metaphor has been reified and objectified to a remarkable extent in literature on Business process reengineering (see e.g. (Hammer and Champy, 1993; Keen, 1991)). The basic workflow loop is used as a means to articulate customer-supplier relations, with customer satisfaction in focus. There is always an identified customer and a performer, with the loop representing a particular action the performer agrees to complete to the satisfaction of the customer. Problems may however arise when this basic loop is applied to any kind of activity, as proposed by Flores et al.

2. Themes in the Criticism of Speech Acts

Speech act theory in the shape of *conversation-for-action* seems simple and attractive, but what is the price we have to pay for this simplification of complex organizational reality? What is actually happening when speech act theory is imported to the field of IT-design? What objections might be raised and why?

It is possible to categorize the criticisms and discussions of speech act based design in several ways. Some arguments are more philosophical in so far as they concern the very nature of theoretical abstractions *per se*. Related to this philosophical concern is the question of how theoretical abstractions could be used in the practice of IT-design.

Further arguments concern the limitations of the particular abstraction comprized by means of speech act theory. These arguments are mainly matters of expressiveness, and a concern for the important phenomena one may abstract away when using speech acts as the abstraction instrument. This criticism is of a more linguistic nature, addressing the appropriateness of speech act theory to give an account of pragmatic phenomena inherent in real language use. These arguments concretize specific shortcomings of speech act theory and give valuable hints of break downs or needed extensions. They are generally of the form “if we abstract by means of theory X, we miss the important phenomenon Y”.

Together these two lines of criticisms form a theme related to different means of theoretical abstractions, in general, and in particular.

Furthermore, it is also possible to identify a set of criticisms related to issues of power, control and rational design of work organizations and their IT-support. This criticism concerns problems with rigid work design versus needs for flexibility, and issues of power relations, such as authority and control versus autonomy. Designing for change and flexibility will entail possibilities of learning, while routinization may lead to deskilling and alienation.

This will raise questions such as: “To what extent is it possible and desirable to achieve a rational design of work? For whom is it desirable?” The need for skill, flexibility, and social responsibility may prevent the possibility of achieving a rationalistic work design.

These sets of criticisms or themes, form a framework for discussing and interpreting breakdowns and limitations of speech act based design in particular, but also IT-design in general:

- 1) The problems of theoretical abstractions
 - 1a The insufficiency of any theoretical abstraction;
 - 1b The insufficiency of particular abstractions, in this case speech act theory;
- 2) The problems with a rationalistic design of work (i.e. problems with rigid design versus flexibility, and global authority versus local autonomy).

3. Speech Acts on Trial

Sorting out the diverse strands of criticism, we start with the criticism directed towards speech act theory *per se*, i.e., as a philosophical and linguistic theory, and related to that, the idea that a theory rejected within its own field should not be imported to another field. An example of the latter critique, i.e., “...that speech act theory has been reified in the design and implementation of IT artifacts after the model has lost its currency in its parent field.”, is found in (Whitaker, 1992).

Such criticism, however, overlooks the fact that a theory exported to a new field often serves new purposes and should be evaluated on new grounds. It also ignores the adaptations that speech act theory has undergone, when applied in its new field. We will discuss some of these changes in more detail below. As we will see, several critics fail to see the implications of this adaptation. (By this we do not mean to say, that it is irrelevant to examine critically the background of imported theories. Rather we wish to qualify such

reflections by considering also the changes that these theories undergo.)

3.1 The Insufficiency of Any Theoretical Abstraction

One line of criticism against speech act theory starts from the premise that human actions are always situated (Suchman, 1987). According to Suchman (1994), some criticisms of speech act theory are based on insights concerning the “circumstantially contingent character of meaning and intention”. Such insights are, however, invoked for many different purposes. For some it denotes a need to construct new theories about communication and language, as for Suchman (1987). However, the reference to the “contingent character of meaning” is also related to a philosophical critique of speech act theory. As such it has quite different implications. It concerns the (im)possibility of classifying the world in an Aristotelian way. Is it possible at all to give an absolute and final account of speech acts in terms of necessary and sufficient conditions in the way Searle does?

The core of this philosophical argument can be brought to light by contrasting the philosophy of Searle with that of the later Wittgenstein (1958). Both Searle and Wittgenstein addressed meaning theoretical issues. Wittgenstein claimed that meaning is not a thing, such as the referent or a speaker’s mental ideas. The meaning of an expression has to do with its use in a *language game*. A language game is a practical social activity. The term denotes something wider than linguistic behavior. The meaning of the word “pain”, for example, has to do with the activity of comforting each other. When two people say they attach the same meaning to an expression in a particular situation, this signifies that they feel successful in their actions at that particular time. When something goes wrong, on the other hand, people say that they misunderstand each other or that they attach different meanings to the words they use. Our use of the word “meaning” is thus related to an infinite number of things that “may go wrong”. It is related to the whole contingent context of use and to culturally determined linguistic

skills. This, according to Wittgenstein, is nothing that can be fully described with words. Searle, on the other hand, believes that social use of language can be fully described by a finite set of rules constituting the social institutions that make certain speech acts, like promising, possible and meaningful. From a Wittgensteinian perspective, speech act theory focuses on certain standard ways in which communication can fail. Such a theory can be useful for several purposes, but it can never be a solution to philosophical problems. It can never function as a complete theory of meaning.

Wittgenstein saw philosophy as a kind of therapy. Many philosophical problems arise because we become confused when we face formulations of constitutive elements of a language game. These philosophical problems, such as the problem of meaning, can be *dissolved* (not solved) if we reconsider obvious and overlooked aspects of our language use. According to Wittgenstein, philosophy should not construct new systematic theories. His philosophy is *anti-theoretical* in this respect. His “theory” of meaning consists of the view that there can be no theories of meaning.

A philosophy with many similarities with Wittgenstein’s is that of Derrida (see (Staten, 1984) for a comparison). Derrida explicitly discusses speech act theory in (Derrida, 1988), in which he focuses on the impossibility of making a strict separation between normal and non-normal forms of language use.

Even accepting Wittgenstein’s view of philosophy (which of course is open to criticism) and of meaning, where does this leave us when creating a theoretical basis for the design and development of IT-artifacts? Will our research questions dissolve by means of a Wittgensteinian therapy, or could we benefit from having systematic theories about work and communication? That work (and linguistic actions in general) is contingent and situated in character does not necessarily lead to the conclusion that speech act theory is useless in designing IT-artifacts. It may lead to a renewed insight that speech act theory is only an abstraction focusing on certain aspects of language and disregarding others. This, in turn, may lead to a renewed examination of speech act theory and how it can be applied.

As mentioned above, it is important to be clear about how speech act theory is used to solve new problems in its new field. In

this new context, people are not concerned with abstract philosophical problems of meaning. One major difference is that linguists and philosophers are *passive observers*, describing social interaction, while IT-developers are *active designers* of such interaction.

From a Wittgensteinian perspective, any attempt to produce a theory of meaning fails, simply because it is a theory. This is, however, not applicable to the use of speech act theory in IT-design. It is a reasonable criticism against speech act theory as a philosophical theory, but not as a practical theory to be used in a design situation. On the contrary, this type of philosophical consideration can be used to question the relevance of linguistics and philosophy to IT-design, in the first place. Our task is not to search for an ultimate “true” philosophy or linguistic theory about communication or social interaction. Instead, we should turn our focus to the concrete and unique problems in our own field. The crucial question concerns what needs to be articulated about work and communication to improve current praxis in the development and use of IT. We also need to distinguish between the needs for articulation among researchers, systems developers and users.

However, there are situations in which we believe appealing to the situated character of communication and work is a relevant way to problematize the role of theories as such in our field. We will here give three examples of such situations. *Firstly*, the argument is relevant whenever a theory claims to give an objective, absolute, and final account of human interaction. As such the argument concerns our attitude towards theoretical issues in information systems (IS) research. Is there a positivistic truth about work and communication, or are all theories sufficient and useful only for certain purposes? Unfortunately the IS-field is dominated by commercial interests tending to strengthen and popularize such positivistic claims. This, in turn, reverberates in academic debates. It would be disappointing, however, if the discussion about the applicability of speech act theory were to become dominated by commercial exaggerations. *Secondly*, there is the problem of a rationalistic design of work, which is discussed below. To what extent is it possible and desirable to design work? For whom is it desirable? Who should be the designer? This is one of the major concerns of Suchman (1994).

Thirdly, if there exists a need to design and to plan work, how should such a design be achieved? Through formal requirements analysis, abstract modeling, and theoretical analysis or through practical tests and a continuous design-use iteration? In what respect do we need to theorize about work? There are approaches within the IT-field that are directly or indirectly influenced by the philosophy of Wittgenstein, such as Ehn's tools approach (Ehn, 1988). Here the emphasis lies on practical involvement in work during IT design and development. In this respect Ehn and others share an anti-theoretical attitude with Wittgenstein, but from a more practical point of view. Of course, the need for a particular development method varies with different kinds of work settings. A major problem when designing IT artifacts is finding a balance between theoretical reflection and practical involvement in work.

Note that none of the points raised above are specifically about speech act theory. They can be applied to many development methods that use formal and abstract description techniques to describe work activities, such as petri-nets, flow-charts, state-transition diagrams, and information-flow diagrams. The use of these methods tacitly assumes that work should be designed, and performed under a set of constraints.

To conclude, observe that an appeal to the situated character of work (and of human actions in general) is related to all three themes presented in this paper: it has been an inspiration to search for new theories; it can be used to problematize the role of theories as such; and it is related to the problems associated with a rationalistic design of work.

3.2 The Insufficiency of Speech Act Theory

In this subsection, we will give an overview of the concrete shortcomings of speech act theory and present extensions and alternative approaches. As mentioned above, the situated character of work may play a role here as well. It can be viewed as one of several phenomena a theory of work should capture. One such example is the discussion about the articulation of work that

incorporates a notion of how work articulation is needed to aid situated work activities. Another example is Suchman (1987), who sets out to investigate interactional competencies and their social and material foundations.

3.2.1 Articulation work

The concept of articulation work (Gerson and Star, 1986; Schmidt, 1993) was developed to handle the fact that co-operating actors, have to articulate (divide, allocate, co-ordinate, schedule, mesh, interrelate et cetera) who is doing what, where, when, how, by means of what, and under which constraints. The dimensions of articulation work include actors, responsibilities, tasks, activities, conceptual structures, information resources, material resources, technical resources and infrastructural resources.

Articulation work goes beyond a communicative approach. In several respects it has a broader scope than speech act theory. However, there is not necessarily a conflict between the two, if the latter is viewed as one of many ways in which we can articulate communicative aspects of work.

3.2.2 Discourse versus Conversation

Much of the sharper critique of the speech act approach in IT-design emanates from an ethnomethodological tradition. Even if there is some common theoretical ground of the language/action perspective and ethnomethodological approaches, at least if we refer to the original hermeneutic arguments developed by Winograd and Flores (1986), they are emanating from fundamentally different traditions in the study of pragmatics. These traditions, *discourse analysis* and *conversation analysis*⁶, represent two different approaches to the study of language use in linguistic research (Levinson, 1983), but when speech act theory is adopted for IT-design, the terms

⁶Note that this is a simplification. There are several approaches within or related to these traditions, e.g. interactional social linguistics and ethnography of communication are closely related to Conversation analysis (see for example (Schiffrin, 1994)).

“discourse” and “conversation” are used as synonyms. According to linguistic terminology, the conversation-for-action schema would be called the "discourse-for-action schema".

Discourse analysis applies traditional methods and theoretical principles of formal linguistics as rules and well-formed formulas to larger units than the sentence. By isolating a set of basic units of discourse (e.g. speech act types), and formulating concatenation rules over these, well-formed sequences of these basic units are defined as coherent discourses. Discourse is, in this tradition, just a larger unit than the sentence, on which the same techniques can be used to delimit well-formed sequences of constituents from ill-formed ones (Levinson, 1979). This approach covers both work on text grammars (which is outside the scope of this paper) and various works on speech acts.

A discourse may (in the sense it is most commonly used in work on IT-design by Flores et al. and Lyytinen et al.) be viewed as a generic, goal-oriented office task. It is a globally managed sequence of communicative actions (speech acts), forming a coherent and predetermined course of action leading to a goal.

Conversation analysis, on the other hand, emerged with an approach to sequence in social interaction avoiding the restricted formalisms that constrict the speech act notion of interaction. Conversation analysis is an empirical approach, rooted in ethnomethodology, contrary to the more schematic theory construction of speech act theory. The conversational paradigm denotes a more or less informal way of talking, where two or more co-present participants freely alternate in speaking as in face-to-face communication. However, many studies have also been undertaken in formal or institutional settings, where the course of turns in the interaction is more predetermined and rule governed, e.g. courts, churches, schools, hospitals (see for example (Drew and Heritage, 1992)). This tradition has also been used as a foundation for IT-design, as in human-computer interaction (Suchman, 1987), and Computer supported co-operative work (Bowers, 1993; Bowers and Churcher, 1988).

According to work in conversation analysis, conversational sequences are rarely structured in the way indicated by the

conversation-for-action schema, i.e., request - promise - assertion - declaration. Instead, certain kinds of utterances seem to go together in pairs, like question-answer, greeting-greeting, offer-acceptance et cetera (Levinson, 1983). This kind of pairing, *adjacency pairs*, is an important characteristic of conversation. Utterances that go together with *requests* to form adjacency pairs, are not promises, but compliances or rejections. In many situations the most natural response to a request is complying with it (or rejecting it) without any promising taking place in between. Furthermore in real conversations it is common to issue a pre-request before a request is uttered. The pre-request functions as an initial check whether certain preconditions obtain. A pre-request could also function as an indirect request.

A conversation is guided by turn taking conventions which regulates when one person stops talking and another starts, i.e., who may speak when. While the course of action in a discourse is globally managed, by means of the constituting rules of a well-formed discourse, the course of action in a conversation is locally managed by the participants. Local control is maximized for both the distribution of turns and the selection of topic, that is “who talks and what gets talked about is decided then and there, by the participants in the conversation, through their collaborative construction of the conversation course” (Suchman, 1987).

In contrast to a globally managed system, turn taking conventions organize just the transition from one speaker to the next. There is no predetermined order in which the turns should be issued. A locally managed conversation is thus a highly interactive phenomenon. The opposite of free conversation is found in rituals or ceremonies, where almost every move and every utterance is pre-allocated (e.g. a wedding ceremony). Here both content, speaker and turns of utterances are determined beforehand.

An office procedure may well be anywhere in the scale between strict globally controlled discourses and free unrestricted conversations. The contact with a customer may follow a strict predefined format (as a kind of generic discourse), or there may be room for creativity and improvization. In designing work procedures and IT-support for contracting and negotiation with

customers we need to handle both situations. Arguably, the conversation-for-action schema can handle only strict predetermined sequences of speech acts.

3.2.3 The multi-functional nature of communicative acts

Another line of criticism against the Searlian speech act theory concerns multi-functionality. According to Allwood (1980), our common-sense classification of communicative actions shows systematic ambiguities. These can be seen as instances of a general ambiguity in our ordinary conception of action. Allwood lists four factors commonly used as criteria for classification:

- (i) The intentional phenomena governing the behavior**
- (ii) The form of the behavior**
- (iii) The result which is achieved through the behavior**
- (iv) The context in which the behavior occurs**

The ambiguity arises in two ways. Firstly, we could classify an utterance from several different points of view, i.e., as regards (i) - (iv). Secondly, as regards (i), Allwood considers a communicative act to be a parcel of communicative intentions. He claims that multi-intentionality is the normal case in communication. Further discussion on how Searle's classification of speech acts fails, can be found in (Allwood, 1977, 1980).

To this we may add that the interpretation and classification of a specific speech act in a specific situation could result from negotiations among the involved parties. The speaker's intention may be vague and open to how the listener responds. This phenomenon has been studied in conversation analysis (mentioned above).

In the conversation-for-action schema, a one-to-one mapping between specific utterances and illocutionary acts is taken for granted. A message will either count as a request, a counter offer, a rejection, a promise, a declaration, et cetera. In this context, however, the one-to-one mapping is *designed*. People adhere to a predefined

schema. In a specific sense it is decided on beforehand how the actions should be interpreted. (This is, of course, true only to the extent that people use the system in the intended way.) Once again we must consider the difference between describing and designing social interaction. In a way the problems inherent in the one-to-one mapping *per se* disappear. However, the discussion about multifunctionality is now turned into the question of what specific classification of speech acts is needed in a design situation? Is it reasonable to have only one classification? If so, which one should be chosen?

The taxonomy in the conversation-for-action schema is not motivated with an explicit theoretical discussion about alternative classification criteria. Rather different speech act types are presented as self evident. In other approaches, such as the Sampo method (Auramäki, 1988; Auramäki et al., 1988, 1992a, 1992b), the Searlian classification is largely adopted as is. Little is added or changed to the theory to make it fit the context of IT-design. Practical experience with the Sampo method, has lead to the conclusion that concrete classification of particular speech acts depends on the perspectives one may have in different situations.

All in all, we conclude that a theoretical discussion about the most reasonable classification criteria of speech acts for a design situation has not yet been sufficiently addressed.

3.2.4 The limited notion of context

The Searlian speech act theory is also criticized for its limited possibilities of referring to the wider social context in which the conversation is embedded. In speech act theory one focuses on the performer of an idealized utterance. It has a sender perspective, rather than a receiver or social-interactional perspective. The illocutionary act is constituting the core of meaning. Meaning is fundamentally emergent from the utterance, and speech act theory is therefore claimed by some authors to be drastically decontextualized (Drew and Heritage, 1992).

A theory of speech acts is basically concerned with mapping utterances into speech act categories. This mapping may rely on complex contextual cues, related to socially or culturally constituted

activities where language plays a specialized role. Examples of such culturally identified activity types, or speech events, are teaching, job interviews and conferences. The notion of context may be quite complex and how many and which variables that should be taken into account is an open question (see for example (Levinson, 1979, 1983; Lyons, 1977)). The conversation-for-action schema, can be seen as representing *one* such activity type, i.e., the contracting speech event between customer and supplier.

3.2.5 Social roles

According to Flores et al. the typical office comprises a structure of recurrent conversation patterns associated with formally declared roles: group manager, assistant, programmer et cetera (Flores et al., 1988). The role structure is assumed to be stable and not under negotiation or change. Positions and power relations among the users are also assumed to be stable. This view leads us back to a notion of organizations as bureaucracies, and away from the powerful view of organizations as networks of commitments, also put forth by Flores et al.

Should we design for stable structures, or should we design for change? If we consider language to be social, inter-subjective, and a means through which we create our social reality, a language oriented view on design should have a more dynamic and nuanced concept of roles. New roles emerge that mature and institutionalize and old ones are reshaped continuously. Just by intervening in work with computer artifacts new roles are formed. This formation of roles must be taken into account in designing work and IT-support, since computer mediated communication will obviously play an important role in this formation process.

3.2.6 Cognitivism and individualism

A classical problem within philosophy of language concerns the relation between the private and the socially public world. Beliefs and intentions belong to the private realm. Conventions belong to the social and public realm. The problem is: How can we talk about

intentions in the first place? What do we mean by that? In speech act theory, both intentions and social conventions play crucial roles. In philosophy of language it is often claimed that we should only refer to public items, when explaining our use of language. Language, according to this view, is an inherently social phenomenon. Wittgenstein's private language argument is held by many to be conclusive on this point.

However, many people find it counter-intuitive not to take intentionality into account. Maybe Wittgenstein can guide us further on this point, in illustrating why it feels counter-intuitive *both* to eliminate references to the mental *and* to take these references as literally referring to something behind, within, or beyond the body. He says the body is a mirror of the soul. We can not talk about either one of them, without the other. The concept of body and the concept of soul are mutually dependent on each other. References to mental events can not be understood properly, without bodily manifestations. At the same time, we can not understand these bodily manifestations, unless we interpret them as manifestations of something mental.

While the philosophical problem of mental vocabulary is too complex to address here, a question that *is* relevant to consider, is whether appealing to intentions is crucial when using speech act theory in the design of IT-artifacts. This use may very well unite with the currently popular cognitivist tendency in many branches of computer science. However, we believe social and conventional aspects of communication must be more relevant to consider in the design of IT support for organizational communication. (This is also stressed by Winograd and Flores (1986).) A heavy focus on intentionality may lead to a narrow individualistic perspective.

3.2.7 Organizational agents

The Searlian speech act theory can be criticized for having a too individualistic focus also in another sense. In IT-design it is relevant to consider social groups and organizations as responsible agents. A promise may create a commitment for an organization or a department, and not for the individual performing the speech act.

We thus need to introduce a notion of “representatives”, in the sense that a sales person is a representative for an organization. This means that the sales person acts “on behalf of” the organization. When this person accepts a customer order, a commitment is made for the whole organization. This commitment may, in turn, be administered by creating “sub commitments” internally within the organization, where one department is committed to another.

In a way, this adaptation of speech act theory has already begun. In the Action Workflow approach, a workflow may have several sub flows. Some of these sub flows correspond to sub commitments (Medina-Mora et al., 1992). In addition to this, the Sampo method attempts to illustrate the relationship between different commitments in the notion of “co-ordination of commitments” (Auramäki et al., 1988). However, we believe that this needs further elaboration. In both methods the notions of commissives and workflow commitments, respectively, are primarily based on Searle’s individualistic perspective.

3.2.8 Propositional content

In the conversation-for-action approach, the information content of speech acts is ignored (Schmidt, 1993). The schema focuses on *who* is communicating *when*, and not on *what* is communicated. The method does not, for instance, include ready-made schemas or templates for documents or databases to be used. In the Searlian speech act theory, on the other hand, the notion of propositional content plays a crucial role. It is, for example pointed out that the information content of a threat must not describe something beneficial for the hearer. (That is why the utterance “Watch out, or I’ll give you 1000 dollars.” may function well as a joke, but not as a sincere threat.)

This separation of the concern for information content and information context is related to a set of modeling-administrative problems. If we combine the two, there would be redundancy problems. Consider for example a process model specifying that secretaries send invoices to customers. Consider then a model of invoice documents. The latter model would probably reduplicate

parts of the former, since an invoice typically contains information about its sender and its receiver. In (Holm, 1996) it is pointed out that any approach combining models of information content with models of information context demands a non-conventional formalization of, e.g., ER-models. It is also pointed out that we need an analogous expressiveness regarding processes. We should be able to relate support functions in the IT-system in various ways to user behavior. In (Holm, 1994, 1996; Holm and Ljungberg, 1996) a modeling framework is presented that meets these requirements.

3.3 Problems with a Rationalistic Design of Work

We now turn to the second major theme in the criticism of speech act theory, namely problems with a rationalistic design of work. This notion needs some clarification. In a way, all social activities are designed. We are always affected by a set of social conventions and rules in our actions. In another sense, all activities are situated and performed with a certain freedom and responsibility. However, what we aim at here is a practical characterization of work situations, relevant for IT-design. We build on the intuitive notion that work is routinized, planned, and structured to different degrees in different situations. What is more important is that an organizational change process introducing new IT-artifacts, often calls for new decisions regarding the degree and character of the structure, plans, and control of work, i.e., how work is designed. Our concern in this section has to do with the problems if, how, and for whom it is desirable to design work, and how such issues affect the aptness of using speech act theory.

3.3.1 A control-oriented way of working

It has been claimed that the conversation-for-action approach leads to a control-oriented way of viewing work. It has been criticized for being a rigid form of controlling the workflow, forcing users to perform their work in a certain way, with no possibility of changing or editing the sequence of speech acts. Criticism by Suchman (1994)

concludes that: “the adoption of speech act theory as a foundation for system design carries with it an agenda of discipline and control over organization members’ actions”. In the light of this critique, the hermeneutic argument developed in (Winograd and Flores, 1986) turns out to be a traditional control-oriented positivist perspective in practice. The implication of this criticism is that the conversation-for-action metaphor is unable to articulate work in other terms than obligations. It is only valid in work domains characterized by explicit command and control structures (Schmidt, 1993).

In this context, it is worth noting that a certain confusion exists as to how the conversation-for-action schema should be interpreted and on what grounds it should be evaluated. It is claimed to represent a universal structure “implicit in all interactions where actions are being co-ordinated among people” (Winograd, 1994, p. 192). This seems to imply that using the schema is neutral. It does not essentially change the way co-ordination takes place. However, the reference to the universal character of the schema is problematic in several ways. All co-ordination may be theorizable in these terms, but in what sense are we dealing with an “implicitly existing phenomena”? Even if this is accepted, there is a need to discuss the effects of making it explicit (Suchman, 1994; Lynch, 1995). Again we must make a clearer separation between a descriptive and a normative use of the schema, or as Lynch puts it, “between naturalistic and instrumental justifications” of the schema (Lynch, 1995).

Despite the resort to the universal character of the schema, we find many examples of an instrumental perspective in (Winograd, 1994), where Winograd states that the schema should be viewed as a practical building block in design and not as the ultimate theory about human co-ordination. He also admits that the explicit representation of such co-ordination is appropriate only in some situations. Moreover, when the schema is used in industry, it is accompanied with a set of very specific claims concerning the organizational effects of using it. It is claimed that introducing one responsible person for every workflow leads to better customer service. It is also claimed, in the area of Business process re-engineering, that it increases organizational effectiveness to impose

customer and performer roles also in situations where these labels are not naturally employed. An example of this would be to view the relation between a student and his/her supervisor as a customer-performer relation (in any direction). One of the most debated claims is perhaps that the use of explicitly identified, clear and unambiguous speech acts are generally preferable and leads to more effective co-ordination.

We believe the issues raised by Suchman are important and relevant when we discuss the design and use of IT. However, it is important to separate the very process of articulation, categorization and work design in general, which addresses the use of speech act theory, from the use of the conversation-for-action schema. The schema is more narrowly applicable than speech act theory, in the sense that it assumes two specific social roles — that of a performer and a customer, and one generic purpose of communication — to administer commitments. It may be claimed that Searle's theory is also applicable in situations with other social roles, for example that of a tutor and student, or in situations with other purposes of communication, such as when describing a discussion between a customer and a performer during work performance. The schema is something new and unique. The claim that it is a central co-ordinating structure for human organizations rests on theoretical assumptions that go beyond original speech act theory.

The criticism also needs to be more precise as to what it is in the use of the language/action approach that aligns with a managerial perspective (as Suchman claims it does) and in what respects certain interests can be classified as managerial. Exactly what is it in the use of the conversation-for-action schema that leads to a control-oriented way of viewing work? Is it related to general problems of creating categorizations of some sort, or is it related to the particular categories in the schema? Is it the very idea of structuring the communication process or is it the use of this particular structure? Is it how the schema is used by practitioners or how it is intended to be used by the original authors (Winograd, 1994)? Is it how it is used in the Co-ordinator or in the Action Workflow system? Is it the use of Searle's theoretical concepts? We believe the problem at hand is related to all of the above mentioned

issues, but in different ways. To some extent it concerns concrete technical details regarding how the schema is implemented and used in contemporary Workflow management tools. Here are some reflections: as regards the use of the schema in the Action Workflow system, it is based on an assumption that there should exist predefined roles with strictly defined responsibilities. The course of actions is strictly defined according to a fixed schema. Everything people do is supposed to be initiated by a request from someone else. The schema is assumed to be globally managed. A potential defence of the schema, in this context, is that it is only the course of actions that is predefined. The particular decisions are not necessarily controlled by strict rules. Since it is easy to change the schema, it can also be used with flexibility as regards changes of the communication structure.

To a certain extent, the above criticism of the schema has a narrow focus on how it is used today, and fails to discuss other potential uses of it. Even if the schema is not regarded as generally applicable to all co-ordination in organizations, this does not mean it is worthless. Moreover, the schema needs not to be applied restrictively. For example, it can be used as a reference model in a design situation. This approach is taken in (Holm, 1994) where an extended version of the schema is applied to routinized ordering procedures. Many traditional database applications mirror a communication structure similar to this schema. These databases typically contain information about customer orders, order verifications, deliveries, invoices, payments, et cetera. In traditional modeling methods all this would be described in terms of entities and relations. In such situations the generic schema can be used to reveal a recurring structure regarding relations between organizational speech acts, the information content in a database, and the dynamic behavior of IT-artifacts. This is perfectly doable, without applying the schema to *all* organizational co-ordination. One can also argue that this would not be to impose a new and foreign categorization of the organizational actions. Rather the schema is used to make explicit certain relationships between already existing concepts and categories.

As mentioned above, a part of this discussion is not specific to speech act theory *per se*. It concerns the general problem of knowing when and why work should be designed in the first place, e.g. whether certain activities need to be planned, structured, explicitly categorized, and defined, at all. The following list contains a set of work characteristics making a strict rationalistic design of work less desirable. The more desirable these characteristics are, the more people must work with a certain amount of freedom and flexibility.

- rich utilization and development of human skills and continuous learning,
- rich utilization and development of social competence and responsibility,
- rich and diversified human interaction.

We believe most organizations contain a set of activities that are desirable to routinize and control. There is, for instance, a huge difference between the task of sending invoices and that of portfolio management in a bank. In many situations there are also conflicts between management perspectives and worker perspectives regarding these issues. However, even though global control and planning is a typical example of a managerial interest, managers are not the only ones having such interests. To a certain degree it comes with the very idea of organizing work in organizations. A certain conformity in practice is also a prerequisite for using language and taking part in social activities in general. Increased global conformity in categorization is not necessarily only a managerial concern. Nor is there necessarily a conflict between increased global conformity and a need for autonomy and flexibility. We can of course always theorize about political conflicts in the process of articulation, but in what situations is this really important?

One part of the discussion about the applicability of speech act theory concerns situations where routinization and control are more generally desirable and less politically loaded, such as in ordering procedures in large organizations. The application of speech act theory in this realm is something different from an attempt to

describe and design all kinds of organizational communication in terms of speech acts.

Another crucial question is how a particular design of work should be viewed: as a social contract, a management directive, or a suggestion and a resource for a situated action? How should it be used in the concrete work practice? Finally, but not least: Who should be the designer? However, these questions are of a more general character and can be raised in relation to any and all types of development method.

3.3.2 Reshaping power and authority relations

A related criticism of Searlian speech act theory is that of Habermas (1984). He presents a theory of communicative actions, where each action is viewed as containing three claims: a claim to truth, a claim to justice, and a claim to sincerity. An action succeeds if the hearer accepts all three claims. If this is not the case, the participants may enter a negotiation about the validity of a claim. Besides communicative actions, there are strategic actions. When involved in strategic actions, participants strive for their own private goals. When involved in communicative actions, on the other hand, they are oriented towards mutual agreement.

This theory is claimed to be superior to Searle's theory in several respects, and consequences for the design of IT-artifacts are discussed by Dietz and Widdershoven (1992). It is suggested that the conversation-for-action schema should be extended with an account of strategic action and negotiation of validity claims.

Habermas apparently considers more functions of language than does Searle. However, the question is how Habermas' insights should be used in the design of IT artifacts. Here we face again the problem of importing ideas and concepts from a passive descriptive theory into an active design situation. As mentioned above, the contemporary use of the conversation-for-action schema has been criticized for not considering the effects of making things explicit, (Lynch, 1995; Suchman, 1994). The argument that the schema is a "true" theory about human co-ordination is insufficient to justify its use in design. When discussing Habermas, there is a risk that we

make the same mistake all over again, but with another theory. The basic argument in (Dietz and Widdershoven, 1992) is that since Habermas' theory is "truer" than Searle's, the latter is also more preferable as a foundation for IT design. But this is obviously not true as a general statement. When it comes to strategic actions and negotiation about validity claims, the benefits of being explicit about one's communicative intentions are even more questionable. What would the effects be? Should we stimulate people to question each other's work roles and formal positions? When is this fruitful? Is it good to structure and formalize such communication? To what extent, when, and in what ways should conflicting goals be made more visible? Should you explicitly classify your statements so that other persons know when you are striving towards your own private goals? Is this doable? If you are about to cheat someone, will this be done more effectively if you utter the formula "I hereby cheat you"?

An alternative approach, which we would like to suggest, is applying Habermas' theory as a vehicle for reflection, rather than using his taxonomy in concrete design. In this context, insights regarding the nature of strategic and communicative actions could be used to understand if, why, and how communication at work should be designed at all. If we expect conflicts among work groups, is it reasonable to strive for consensus regarding a specific design of work and communication, or is it more reasonable to leave this issue open? On the other hand, it may be preferable in such situations to introduce formal relations in order to avoid unnecessary and reoccurring disputes.

4. Conclusions

In this paper we have discussed the applicability of using speech act theory as a foundation for the design of IT-artifacts for work and communication. We have elaborated on two themes to which various criticisms and needs for extensions are related: firstly the problems with theoretical abstractions in general and in particular, and secondly the problems with a rationalistic design of work.

The following list is a *framework for understanding the various shortcomings* of the current use of the conversation-for-action schema in the CSCW-area. It may serve as a guide to which situations the schema should be applied.

- Is there a need for a rationalistic design of work?
 - Is there a need for flexibility in work performance?
 - Is there a need for flexibility as regards social roles and authority relations?
 - To what degree do we expect co-operation or conflicts among different work groups?
- What specific social roles exist?
- What is the general purpose of communication?

The first point in the framework concerns the general problem of design, as discussed above. The problem of work design versus flexibility is related to certain characteristics of work situations: rich utilization and development of human skills and continuous learning, rich utilization and development of social competence and responsibility, and rich and diversified human interaction. If these characteristics are desirable, people must work and communicate with a certain amount of freedom and flexibility concerning work procedures as well as social roles and authority relations. As the conversation-for-action schema is currently used, it results in a restriction on communication structure. This is also true for the current use of speech act theory in IT-design in general. Hence the need for *not* having a rationalistic design of work, in the above sense, leads to a failure for both the conversation-for-action schema and the use of speech act theory in general. It also leads to a questioning of the assumption that there should be fixed social roles with clearly defined responsibilities. Moreover, if people are not striving for mutual understanding in communication, if there are conflicts and people attempt to manipulate each other, then Searle's taxonomy is insufficient. Here we may also ask why, and how this type of communication should be structured and designed, if it should be so at all?

The design, structure, planning, and control of work is not a one-dimensional problem. Many things may be structured, such as work and communication procedures, social roles, responsibilities,

work and communication content. The conversation-for-action schema focuses on the communication structure. Searle had a more explicit focus also on the propositional (information) content of speech acts.

We have also discussed the questions: how shall the design be achieved, through abstract analysis or through practical test and design-use iteration? Who should be the designer? In many tools based on the conversation-for-action schema it is easy to change the schema and the behavior of the system. We believe this purely technical feature plays an important role for the acceptance of these tools, since it allows for a continuous reflection and re-design of existing work practices. This feature has, of course, nothing to do with speech act theory *per se*. Moreover, the current use of the conversation-for-action schema assumes that the communication should be globally managed, which is another type of restriction.

In addition to the above, the conversation-for-action schema rests upon a set of specific assumptions about the social roles (customer and performer) and the purpose of communication (to administrate organizational commitments). The schema will hence also fail if there are (and should be) other social roles or other purposes of communication. The Searlian speech act theory is more general in this respect. Finally, the schema can be criticized also in situations where customers and performers communicate in order to administer commitments. People may want to edit the sequence of speech acts. This criticism may be remedied by using the schema less restrictively. It may, for example be used as an editable reference model in a design situation.

In the discussion about the applicability of speech act theory as a foundation for IT-design, it is important to be aware of the *adaptations* the original speech act theory has undergone, when applied in its new field. In this paper we have mentioned the following existing changes and needs for further adaptations: 1) A new focus on relations between organizational commitments. 2) The need for further elaboration of the notion of organizational commitments, as opposed to commitments of individuals. 3) The need for further discussions about alternative classification criteria for design. (In the conversation-for-action schema the speech act

types are treated as primitives, and the Searlian classification is abandoned.) We have also mentioned, 4) the possibility of extending the speech act concept with a notion of situation types, where “customer-supplier communication for action”, is but one example.

Current work on using theories of communicative action as a foundation for IT-design is, in our opinion, only in its initial phases. What has hitherto been explored is only a small portion of its full potential.

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Second paper

Multi-Discourse Conversations

Peter Holm¹ and Jan Ljungberg²

¹Dept. of Computer and Systems Science
Stockholm University, Electrum 230, S-164 40 Kista, Sweden

²Dept. of Informatics
Göteborg University, Box 3147, S-400 10 Göteborg, Sweden

Abstract

The role of speech act theory as a foundation for design of information technology has been vividly discussed and criticized in the CSCW-area. In this paper we extend the speech act approach with ideas from conversation analysis, in order to overcome some of the criticisms. The discourse concept in the tradition of discourse analysis is used to denote routinized and procedural activities in organisations, i.e., as a set of coherent speech acts for which there exist strict organizational rules regarding their sequence, who may perform them, under which circumstances etc. The conversation concept in the tradition of conversation analysis denotes a contingent, situated activity, where the language user is viewed as a competent and autonomous agent, guided by the existing social rules and conventions. The problems with IT-design are interpreted in terms of striving for a balance between efficiency, routinization and global control on the one hand, and empowerment, skill and flexibility for the individual, on the other. Finally we introduce a set of metaphors to illustrate the role played by information technology as a mediator of social rules and conventions.

1. Introduction

Searlean speech act theory [20-22] as it has been elaborated and adopted by Winograd et al. [26, 12, 19, 25, 26] in the so-called language/action perspective, has had quite an impact on methods and theories for design of information technology. Its impact is visible in areas such as computer mediated communication, workflow automation, computer supported collaborative work and business process reengineering. Pioneering work has also been done by Auramäki et al. [1-4] by using discourse analysis to model organizational communication, and extensions and innovations based on the language/action approach have been proposed by several authors, e.g. [5, 7, 8, 9, 14].

A key perspective of the language/action approach is that people not only process information and make decisions, but they act through language [25]. Thus information technology (IT) should also support communicative actions, and not only the storage and processing of information.

The speech-act based modeling and design approaches have however been criticized from a number of perspectives, e.g. that they force a rigid and routinized design of work activities [24], that they do not cover strategic action [10] to mention some. See [17] for a general discussion of the applicability of Searlean speech-act theory as a foundation for IT-design.

Within the Nature project [15] we developed a method for designing IT support for organizational communication, the Commodious method [14]. This method derives from the language/action approach, and the idea is to produce an abstract model of organizational communication and the role of the information system, when formulating requirements on a software system. The method is based on an extended version of the “conversation for action” schema [25, 26]. The conversation for action schema is a generic pattern of speech acts, described as a state transition network. At each point there is only a small set of possible action types. The schema is initiated with a request from a customer. In the Commodious method the schema is not viewed as a generic schema for all kinds of human co-ordination, but it is mainly applied

to ordering procedures with external customers, and it is used as an editable reference model.

In this paper we describe several extensions of the Commodious method. The extensions are based on some of the substantial criticisms of the speech-act approach (as summarized in [17]), but also on the initial findings of a case study [18]. The specific shortcomings of the speech-act approach to IT-design we will address are the following:

- The limitations of a formal, analytical view of discourse analysis in complex situations of rich human-to-human communication;
- The control oriented work design;
- The poor metaphors for describing the functional role of IT-artifacts.

2. Discourse and conversation

The debate about the speech-act based perspective has been likened with a battle between two opposing armies: those who love The Coordinator™ and Action Workflow™⁷ and those who hate them [8]. Much of the sharper critique of the language/action approach has emanated from an ethnomethodological tradition (e.g. [24]). This tradition has itself been used as a foundation for IT-design, e.g. in human-computer interaction [23], and computer supported collaborative work [7]. Even if there is some common theoretical ground of the language/action perspective and the ethnomethodological approaches, they are fundamentally emanating from different traditions in the study of language use (pragmatics), i.e., discourse analysis and conversation analysis. In

⁷ The workflow management system based on the language/action perspective [19].

the following we will contrast these traditions in an idealized way. We will end up arguing that it is beneficial to combine them.

Discourse analysts and speech-act theorists have focused on the sequence in interaction, and established formal models that relate one communicative action to the next [11]. In speech-act theory one focuses on the performer of an idealized utterance, i.e., one has a sender perspective, rather than a receiver or social-interactional perspective. The illocutionary act is constituting the core of meaning and the goal of communication. Meaning is fundamentally emergent from the utterance, and speech-act theory is therefore by some authors claimed to be drastically decontextualized [11].

Discourse analysis isolates a set of basic discourse units (i.e. speech acts), and formulates a set of rules stated over those units. A *discourse* consists of a sequence of communicative actions, with a span over time. This sequence is pre-allocated in that it is defined by rules constituting a coherent and well-formed discourse. The discourse is, in this tradition, just a larger unit than the sentence, on which the same techniques can be used to distinguish well-formed sequences of constituents from ill-formed ones [16]. The discourse is governed by rules, e.g. sequencing rules and coherency rules.

We may use the notion of generic discourses or discourse schemas to design general discourse patterns. A strictly rule governed discourse may be automated with a software agent, i.e., the function of the IT-artifact is to autonomously perform actions. If the notion of discourse in speech-act theory is used to design work procedures, the formal and analytical bias of speech-act theory may lead to a design where work is substantially routinized [24]. This may work well in certain institutional settings, where routinization is desirable. However in situations corresponding to rich human communication, as face-to-face conversation, speech-act based design will have severe limitations. The analytical formalism of speech-acts is “bought at the cost of empirical purchase on the detailed fabric of the social world of interaction” [11]. When there is a need for a high degree of flexibility, the speech-act approach is too restrictive.

The tradition of *conversation analysis* has an approach to sequence in social interaction that avoids the restricted and sterile formalisms that constrict the speech-act notion of interaction. Conversation analysis is rooted in ethn methodology, and is an empirical approach contrary to the premature theory construction of speech act theory. As such the notion of conversation has an element of situatedness, compared to the analytical notion of discourse.

The paradigm case of conversation denotes a more or less informal way of talk, where two (or more) co-present participants freely alternate in speaking (e.g. in face-to-face communication). Conversation is guided by turn taking conventions, rather than pre-allocated schemas. While the course of action in a discourse is globally managed, by means of the constituting rules of a well-formed discourse, the course of action in a conversation is locally managed by the participants.

Local control is maximized for both the distribution of turns (i.e. who may speak when) and the selection of topic, i.e. “who talks and what gets talked about is decided then and there, by the participants in the conversation, through their collaborative construction of the conversation course” [23]. Turn taking is accomplished by a set of conventions or common practices organising just the transition from current speaker to next, as observed by conversation analysts [16]. At any time in a conversation, three things can happen: either the current speaker selects a next speaker (e.g. by directing a question), or another participant volunteers to take the stand, or the current speaker continues.

An other way to locally structure a conversation, is by adjacency pairs, i.e. paired utterances such as question-answer, offer-acceptance etc. These are closely interrelated with the turn-taking system, as a technique to select the next speaker.

The notion of conversation leads to a design of IT-support, where the role or function of the IT-artifact is more of a resource or suggestion. The control is in the hands of the human agent.

We must bear in mind, however, that while the linguistic theories of language have a descriptive aim, the use of the same theories for the purpose of design of IT-artifacts is a normative

enterprise. We may thus in certain situations want routinization, possibly letting a software agent do the job, while in other situations we will strive for work procedures performed by empowered and skilled human actors, and thus design for flexibility. This is the basic motivation for starting off from the language/action approach and not abandon it, but rather extend it with conceptions from conversation analysis. We must also stress that our presentation of the discourse and conversation concepts is intentionally idealized. Both discourse and conversation are concepts with a wide meaning, used in a number of ways and often used synonymously. Note that the *conversation for action schema* [25-26] is rooted in the tradition of discourse analysis. To avoid confusion, in this paper we will use the terms *discourse* and *discourse schema* instead of *conversation for action* in order to denote a sequence of coherent speech-acts.

3. Towards a synthesis

Our aim is to provide a general design method, rather than implementing a specific conversation model as, e.g. the Milan conversation model [8], in which the language/action approach is also extended with a perspective on work practice and communication as complex and situated phenomena.

We will now describe our approach, extending the language/action perspective to include some of the basic ideas within conversation analysis. Our suggestion of a synthesis is based on the identification of certain areas where we believe that the two approaches can be viewed as complementary:

(1) The *time and place perspective* is one such area. We will use the discourse concept to capture relations between activities performed at different times and places, and we will use the conversation concept to capture relations between activities which are all performed in the same situation. With this terminology, an insurance claim is a typical example of a discourse, while a discussion at the cashier desk in a store could serve as an example of a conversation. During such a conversation the customer could issue

new orders and pay old invoices. In a conversation the participants can thus switch between different discourses, open up new ones and close others. One activity can belong to both a discourse and a conversation at the same time. The conversation is then viewed as the “performance context” of that activity.

(2) We also use the conversation concept to *introduce the notion of a situated action*. All talk about rules are relativized. The basic perspective is that the ultimate control of the conversation is in the hand of responsible human actors. However, they can be constrained by social rules and conventions in various ways and to different degrees. The problems with design can then be interpreted in terms of *striving for a balance* between efficiency, routinization and global control, on the one hand, and empowerment, skill and flexibility for the individual, on the other. To illustrate the role information technology plays as a mediator of such rules and conventions, we introduce a set of *metaphors* to be described below.

Notice, though, that our objective is not to capture the full richness of human communication, or even to let our design models contain more details about the performance situation as such. Our achievement is rather to introduce a specific perspective on what people do in a design situation: They formulate organizational constraints and rules for future work practices. Whatever modeling methods we use, we can never cover all aspects of future contingent situations or the competence of human actors to handle these situations. The only thing we can do is to realize this and to have respect for the responsibilities and skills of the people performing the activities at hand.

(3) Used in the above mentioned way, the discourse and conversation concepts capture *two different types of rules and conventions*. Conversation rules are associated with relations between activities performed in the same situation. Typically they have a character of guidelines and suggestions. (Notice, though, that all rules can be qualified in this sense, since we use metaphors to illustrate their functional role in the conversation.) The discourse rules, on the other hand, concern coherence and felicity conditions for the discourse. We can *formulate specific guidelines* for each type of rules. These can be used in a software development context to

support requirements formulation. We will use a generic discourse schema to generate suggestions and guidelines for the design of discourse rules in organizational ordering procedures. We also believe that Grice's conversational maxims can be used to formulate guidelines for the design of conversation rules [13]. Exemplification will be given below.

Notice, that this categorization of rules does not partition the set of rules relevant in the design of organizational communication in a clear cut way. Some rules can be viewed as belonging either to the conversation or to the discourses, e.g. rules regarding the performer. However, we believe that the distinction can be useful anyway. Further characterizations of the rules may be needed.

It is important to realize, that what we present in this document is not yet a method ready to be used by practitioners. In its current form it is rather a theoretical construct for researchers to elaborate on further. It is assumed to be applicable to situations where it is reasonable or unavoidable to have a certain amount of routinization and control, e.g. in organizational ordering procedures.

3.1 Design models

We will now describe how the above synthesis can be achieved concretely by means of a set of design models or schemas. We will thus introduce the notion of a *discourse schema*, which contains a set of rules regarding the sequence of certain activities. This schema is illustrated graphically (see figure 2 for an example). It contains actions, decisions and subprocedures. Speech acts are viewed as a subclass of actions, where the deletion, transfer, or creation of information is the instrument for the action. We assume that speech acts are classified according to some taxonomy based on how information can be used to perform various types of actions.

For each activity in a discourse schema, it is specified who is the speaker and the listener of speech acts, and who is the performer of actions and decisions. The information content of speech acts, rules and conventions for the decisions is described indirectly through the definition of IT-support functions (see below). For each discourse we

specify the parties. In an ordering discourse we specify who is the supplier and who is the customer. A discourse is generally governed by different long term declarations, e.g. “price declarations”, “customer contracts”, “policy regulations”, “customer address” etc. These may be manifested in the software as dynamic control parameters and steering information.

A conversation schema contains a set of specifications of how software modules support conversations of a certain type. It may contain primary discourse sequences that constitute the core purpose for performing the conversation, e.g. a discussion at a loan desk in a library may have the primary purpose of making a reservation for a book. Graphically the conversation schema consists of the primary discourse sequences (see figure 2), symbols for the metaphors constituting the IT-support functions (see table I), and references to other (secondary) discourse sequences. (The conversation schemas are perhaps best understood by looking at the example in section 4.)







Metaphors for IT-support	graphical representation
IT as communication medium	
IT as performance agent	
IT as passive information provider	
IT as active advisor (guidance support)	
IT as tool support	
IT as resource handler	

Table I. Metaphors and graphical model constructs in a conversation schema

The set of metaphors for software modules introduced in table I is a tentative one. It is chosen to cover the most dominating metaphors used in various design methodologies of today. IT can be the *communication medium* for a speech act. In this case there exists a registration event in the system that constitutes the performance of this speech act. IT can also be an autonomous performer of certain

speech acts, i.e. a *performance agent*. Consider an on-line system for customer orders where the system declines an order directly.

IT can serve as a *passive information provider*, or as an *active advisor* giving guidance support. In the latter case we characterize the guidance in terms of “commands” and “advice”. Each decision in a discourse may have a guidance support. The system then contains rules for what decision that should be taken. In these situations, the system may initiate or inhibit software support for future activities in the same discourse.

We use the metaphor *tool support* when the system can be seen as a passive tool, e.g. a drawing program, a word-processor, or a batch for writing a set of letters. Finally IT may function as a *resource handler*, i.e. it is used to handle information that can be seen as a “thing” or a “resource”, e.g. electronic books and articles. They are something that is sold, and are viewed analogous to other merchandise and goods.



Figure 1. Description events in a conversation schema

A vast number of activities in an organization are reported or described after or during their performance. When a book is borrowed in a library, this is reported into the central database of the library. When an invoice is sent to a customer, this is also reported into the database. These events are description events, going on in parallel, or after the “real” events. In the diagrams, a description event is illustrated with a box “behind” the speech act or action (see figure 1).

In some cases the relation between a speech act and its description event is more complicated. It may be essential for the performance of the speech act to count as successful. (Consider a reservation for a book in a library, which is not registered in the system.) In other situations the insertion of information in a database may serve a double purpose. It is both the performance of a speech

act and a report to others that this speech act is performed. (We have adopted the convention that a description event is included in the diagrams only when it results in the production of additional information.)

3.2 Design guidelines and design rationales

We can now use the notions of discourse and conversation to formulate different types of design guidelines and design rationales for IT-artifacts. We believe that a generic discourse schema could serve as a reference model in the design of ordering procedures. We could then start with a standard template that contains a sequence of activities, e.g.: customer order is sent, order is verified, products are delivered, invoice is sent and customer pays order. The template also includes assumptions about the parties, e.g. that it is the customer that issues the order and not the firm, et cetera. We could then edit this template, delete some parts and add others.

The same reference model can also be used for coherence and completeness checking. It may help us to administer a set of details, so that we do not specify the customer to send the invoice or a supplier to be the recipient of a delivery. On the basis of relationships like these, we can also formulate templates and checking mechanisms to help us administer details in the specification of software modules of various types. (See [14] for a further discussion about this.) By using a classification of discourses and their actions, we have also given the design a rationale and we have made the model easier to understand, compared to traditional modeling methods like data-flow diagrams and various types of process models, where all information is viewed as input and output.

We also believe that templates with adjacency pairs like a request, followed by a declination or an acceptance, can be used as a complementary template. It is interesting to notice that this sequence occurs in two parts of the lending discourse in the example below. (If we decompose the subprocedure “prolong loan” it would occur there as well.)

We can form other types of guidelines for conversations. A very simple template rule could be: Whenever there is a conversation with the customer, anything that needs to be communicated with the customer concerning any of the ongoing discourses may be relevant to bring up. If this is accepted, we can automatically add to our software specification a general and passive function: “list all discourses that have to do with a certain customer”. This rule could be seen as a special case of Grice’s maxims of quantity and relevance [13], i.e. you should make your contributions to a conversation as informative as possible and they should be relevant. It can be used both as a guideline and to provide the design with a rationale. We may also want to design specifically important alert messages for certain situations. Consider as an example the concrete rule: “The customer should be informed if he has not paid old invoices, even if the conversation initially concerned something else”. A system designed on the basis of such a rule, would, e.g., alert its user also if the customer wants to change the address or issue a new order. Such a rule could hardly be viewed as a coherence or a felicity condition for the discourse that the conversation originally was about.

Another example of a conversation rule is from the library example below: “If a library customer makes a request for a loan, and if another book is reserved for this customer, then it should be suggested that the customer borrow also this book”. This rule has nothing to do with the decision whether the customer should borrow the requested book or not. It has nothing to do with that discourse at all. The rule does make sense, however, if we are acquainted with the physical location of this conversation — the loan desk. Books reserved for customers are stored at a shelf just behind the librarians. It seems reasonable to suggest that the customer should take this opportunity and borrow this book as well, since he or she now stands a few feet from it. In this way we have means to distinguish between certain rules that are essential for the decision as such, and other rules that are triggered by the physical location of the conversation. From this we can predict that the latter rules should exist in all software modules supporting activities performed at the same location. Another set of rules may be wanted in all

software modules supporting a conversation with a customer, regardless of the location.

4. A library example

In this section, we will exemplify the described approach, by using preliminary results from a case study [18]. The study aims at discussing the applicability of the language/action perspective to describe and design ordering discourses. This is achieved by looking at existing systems for ordering procedures in different businesses settings, and then interpret and describe them in terms of the approach presented in this paper. We also address issues of routinization, and control versus flexibility in the work setting and consequences for design. The first case in the study is a system used in a Swedish library for the administration of loans.

4.1 The lending discourse

The basic ordering discourse in the library is found in the administration of book loans. We call it the “lending discourse”. The information governing the lending discourse is: long term customer contracts (borrowing cards), customer addresses, information about card durations, card invalidations, card re-validations, prolonging of cards, book classifications, customer classifications, lending policies (e.g. default values for loan durations for certain books and customer categories), declarations of delayment fees and lost book fees. The lending discourse involves two parties: the library and the library customer.

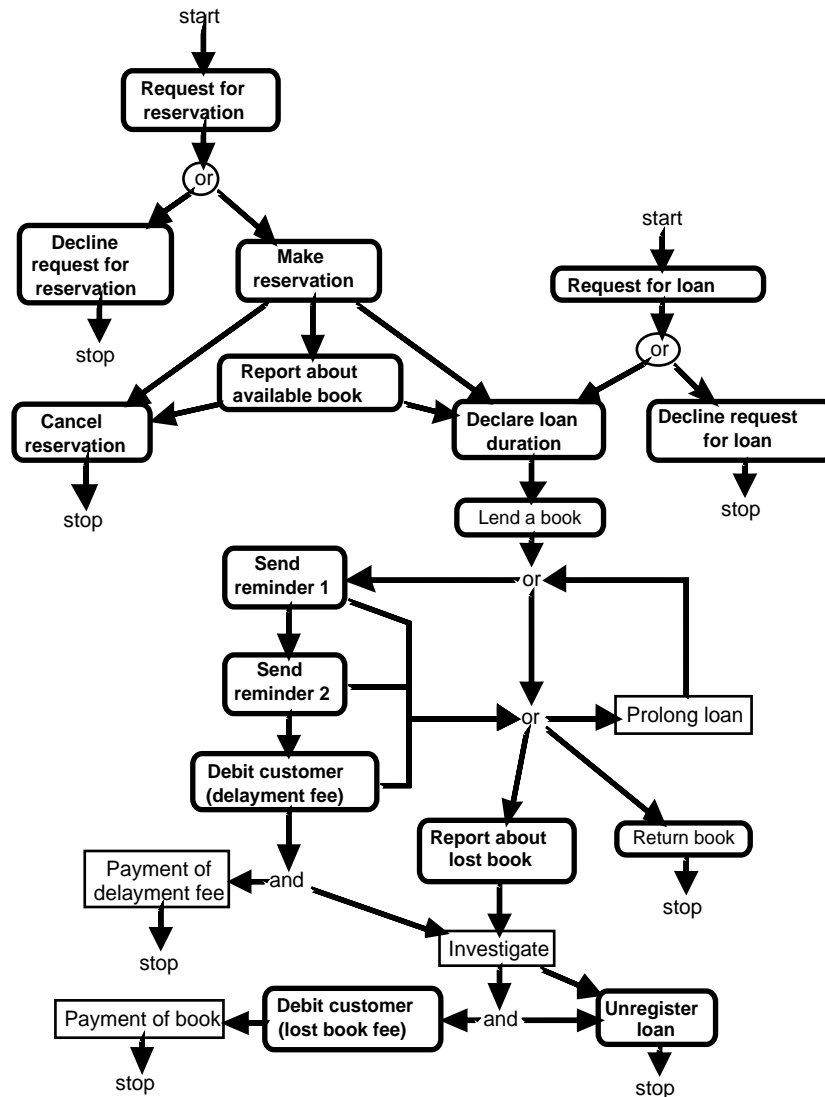


Figure 2. The lending discourse schema in the library

In this particular library it was not specified who in the library that was entitled to perform what activity in the lending discourse. Their IT-system had predefined logon-routines for handling this, which they did not use. This decision was motivated in several ways: It promoted flexible work roles, where people could gradually learn new things and become more responsible. It simulated the staff to be more responsible. They also allowed for the staff to overrule the warnings in the system (as much as possible), in order to be flexible in relation to customer needs. Instead they had weekly meetings where they discussed policy issues together and took joint decisions. Figure 2 illustrates the discourse schema for the lending discourse.

The sequence in the discourse is illustrated by means of arrows. The and-nodes introduce or merge parallel tracks. The or-nodes introduce alternative tracks. A decision is an or-node where we want to state something about the decision, e.g. that it is supported by information technology. The rounded rectangles represent actions, some of which are speech acts. The rectangles represent sub procedures.

4.2 Conversations

In order to describe the conversations, we must recognize certain sequences in the discourse to be the primitive sequences we want to refer to in the conversation schema. These sequences are either performed from start to end in a conversation, or not at all. In the schema in figure 2, each activity constitutes a sequence per se, performed in isolation from the rest, except for “request for reservation sequence” (which contains the activities: request for reservation, decision, cancel reservation / make reservation) and “request for loan sequence” (which contains the activities: request for loan, decision, decline request for loan / lend a book).

Figure 3 illustrates a conversation schema for one type of conversation that is performed at the loan desk in the library. This conversation type is initiated by a request for a loan by a customer. The primary discourse sequence is hence the “request for loan sequence”. There is also a list of other potential activities, e.g. other discourse sequences that may be performed.

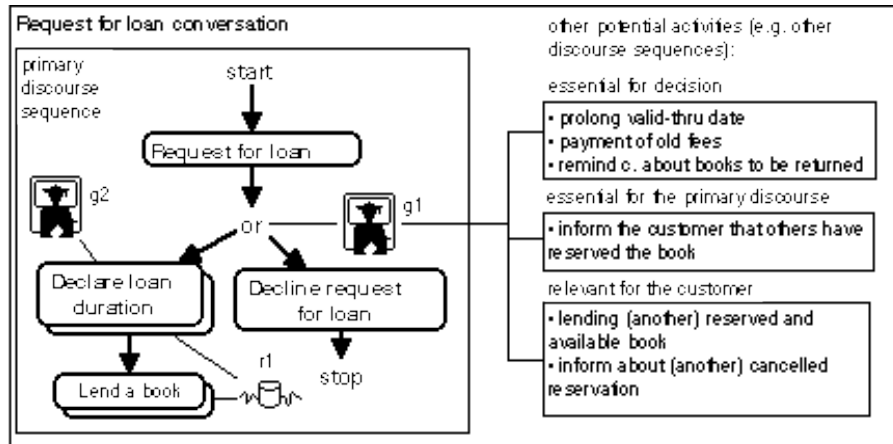


Figure 3: IT support in “request for loan conversation”

The conversation is supported by three software support functions. One advice function, g1, gives advice regarding the decision. The lines from the IT-support function to the listed activities mean that this support function makes suggestions as regards the performance of these activities. Some of these activities are related to this particular decision, e.g. if the valid-thru date has passed, then the librarian is alerted that the request for a loan should (in normal cases) be declined. Other activities are totally irrelevant for the decision, but could be motivated by means of Grice’s maxims of quantity and relevance, as mentioned above, e.g. the alert message that there is a book reserved for the customer. Moreover, there is guidance support, g2, that supports the declaration of loan duration. It generates a default value for the loan duration. When the book is lent, information about the loan, including the loan duration, is registered in the database by means of the registration event r1.

In practice, this is what happens when the discourse sequence is performed: The librarian scans the code on the borrowing card and the code in the book into the system. Then g1 is initiated. g1, in turn, initiates g2 and r1, if the circumstances are appropriate. A registration form with a default value for the loan duration is presented on the screen. To perform the registration, the librarian presses enter.

The following list illustrates the software actions performed by g1. For each action there exists a set of rules that triggers these actions.

- a1 advice acceptance of request + trigger g2 + initiate registration event r1**
- a2 advice declination of request (can be disregarded) (This happens whenever any of the software actions a4 - a5 is taken.)**
- a3 command declination of request + inhibit software support for acceptance of request (g2 + r1) (This happens when the borrowing card is invalidated or if the book can not be borrowed.)**
- a4 suggest that customer pays old fees (registration form for payment is made available)**
- a5 suggest that the valid-thru date for the borrowing card is prolonged (registration form for this is made available)**
- a6 suggest that the librarian informs the customer that old books needs to be returned**
- a7 suggest that the librarian informs the customer that another reserved book is available (software support for lending this book is made available)**
- a8 suggest that the librarian informs the customer that a reservation for another book made by the customer, is now cancelled**

The software actions performed by g2 are only two: a1) Suggest loan duration; a2) Alert the librarian if other customers have reserved the book (the loan duration is then shorter, and the customer should be informed).

We can notice from the above, that the software support for this conversation contains a set of different rules, with different functional roles, and with different social status. One of the major advantages with our approach is to make these differences more visible and to formulate generic rules to be used when similar rules should be formulated in the future. The conversation schema for “request for reservation conversation” looks much the same. It is illustrated in Figure 4.

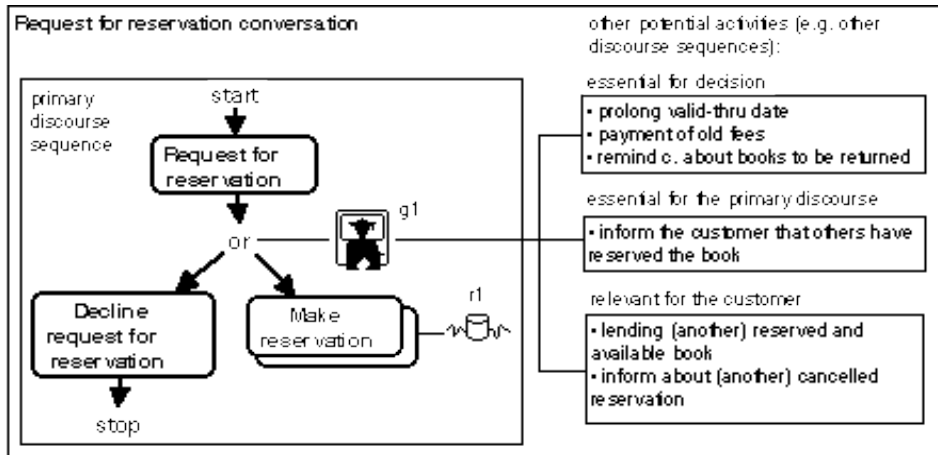


Figure 4: IT support in “request for reservation conversation”

This is a good example of the benefits with sorting out rules related to a general convention to bring up things relevant to the customer. They are not tied to the decision as such but may be brought up in any part of this conversation. It is also likely that these rules occur in a set of several contexts.

Figure 4 describes a “conversation” where the library sends mail to its customers. In this case there is only one party that is active, i.e. the library. One letter is viewed as containing several speech acts. There are three guidance functions, i.e. software modules that contain rules for when these speech acts should be performed. There is also a tool function that produces the physical letters.

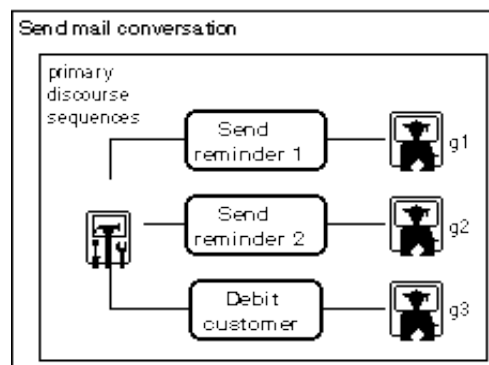


Figure 4: IT support in “send mail conversation”

Figure 6 illustrates the “conversation” where a reservation is cancelled. A commitment is cancelled, but it is not reported to the customer. The speech act is performed automatically through deleting information in the database. This is thus an illustration that we must allow speech acts that delete information and speech acts with unspecified listeners.

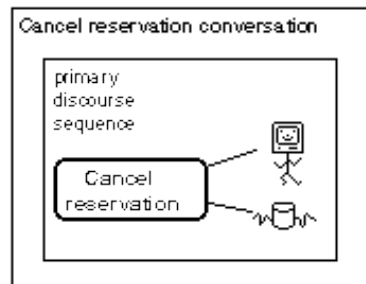


Figure 6: IT support in “cancel reservation”

The above conversations are enough to illustrate the major benefits with the suggested approach. There are, however, also other conversations in the library. For each of the following activities in the lending discourse there exists an IT-supported conversation, for which the activity is the primary discourse sequence: Report about lost book, Return book, Debit customer (delayment fee), Unregister loan, Debit customer (lost book fee). Finally there exists a conversation type where all or some of the delayment fees are paid.

5. Concluding remarks

We have described a novel approach to model work activities and organizational communication. The purpose is to inform the design of IT-support such as computer mediated communication and workflow applications. We have done this by using the notions of discourse and conversation, as they appear in respective tradition in the study of human communication. We take the notion of discourse to be a metaphor for routinized and procedural activities within

organizations, and the notion of conversation to be a metaphor for situated and contingent actions.

By combining the two concepts we have emphasised that there is always a tension and a balance between the two in a design situation, i.e. between designing for efficiency and designing for flexibility and empowerment of human actors. We have also proposed a way to mix the concepts. In a multi-discourse conversation, several organizational discourses are tied together in one situated conversation occasion.

Finally we introduced a set of metaphors for describing the functional role of information technology in relation to social activities. These metaphors illustrate, e.g., how IT mediates social rules and conventions in different ways. Moreover, we have shown how the combination of the concepts discourse and conversation captures two different types of social conventions in organizational communication. By using an example from a case study in a Swedish library, we have shown how our ideas can be used concretely.

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Third paper

Information Technology and Organizational Effects

Supporting the Sales Process with Workflow Technology

Jan Ljungberg*, Peter Holm^{†‡} and Anders Hedman[†]

*Department of Informatics, Göteborg University, Box 3147,
S-400 10 Göteborg, Sweden; E-mail: janl@adb.gu.se;

†Dept. of Computer and Systems Science; Stockholm University; Electrum 230;
S-164 40 Kista; Sweden; E-mail: {pholm,ahedman}@dsv.su.se;

‡Swedish Institute for Systems Development;
Electrum 212; S-164 40 Kista

Abstract

This paper explores the Language/Action approach by reflecting on an explorative case study from a small Swedish company in the IT-sector. The company is using Lotus Notes™ in combination with Action Workflow™ to increase the efficiency of the sales processes. This includes communication with customers as well as intraorganizational communication between people involved in the sales process. We address some of the issues raised in the debate about the Language/Action perspective. Does application of the Language/Action perspective automatically lead to control and routinization of work tasks, or could we find other implications? We propose a framework, identifying important characteristics of

technology and work, which can be used in discussing effects of introducing new technology to improve efficiency in processes.

1. Introduction

Much of the work in today's organizations *is* performed through language. We attend meetings, talk with colleagues, negotiate with customers, talk via phone, send faxes and e-mail. The core of much work has come to be communication, and social interaction. The explosive development of networking and infrastructure enables innovative usage of information technology (IT) to support communication and cooperation in organizations and work settings. The usage of Notes, InterNotes, Intranets and technology we don't know about yet will dramatically change the way people communicate in and between organizations. This calls for improvement of theory and methodology to inform design and to understand the effects and impact of this new connectivity.

One way to do this is to use theories of communication as a starting point. One such approach is the Language/Action perspective, theoretically founded in speech act theory (Austin, 1962; Searle, 1969; 1979). It has become a well-known framework and foundation for modeling and design of computer support for communicative action. From the earliest applications of speech act theory to information systems, such as the Coordinator (Winograd & Flores, 1986; Winograd, 1988), Chaos (De Cindio et al., 1986), and Sampo (Auramäki et al., 1988, 1992), this perspective has been developed and extended in several ways (Bowers & Churcher, 1988; Flores et al. 1988; Kensing & Winograd, 1991; Medina-Mora et al. 1992, De Michelis & Grasso, 1994, Dietz, 1991; 1992, Holm, 1994, Holm & Ljungberg, 1996, Goldkuhl, 1996). It is now a popular base for technology and methods for designing systems supporting workflow and work group cooperation.

In this paper we discuss an explorative case study at a Swedish company in the IT-sector which was using

Lotus Notes™ in combination with Action Workflow™, a workflow tool based on the Language/Action perspective. The objective of the study is to reflect on the applicability and consequences of using speech act based approaches. Does application of the Language/Action perspective automatically lead to control and routinization of work tasks?

In addition we address the more general question how the usage of IT affects organizational efficiency, control and routinization, on the one hand, and flexibility, learning, use of skills, social responsibility, and rich human interaction, on the other.

For a more detailed presentation of the case see Ljungberg and Holm (1995a) and Holm et al. (1996). The study is part of an ongoing research activity, where we explore and extend the Language/Action approach (Holm 1994; Ljungberg and Holm, 1995b; Holm and Ljungberg 1996).

2. Background

In the Language/Action perspective, information technology is seen as an artifact supporting human communication and not primarily as a device for storage and transaction processing. This shift in focus from storage to action has had a great impact on systems design and thinking about IT-usage. We will not give a full account of the Language/Action perspective here, but only draw attention to some of its basic assumptions.

- The primary dimension of human cooperative activity is language. Action (and work) is performed through language in a world constituted through language.**
- Cooperative work is coordinated by the performance of language actions.**
- The act of doing something, and the recurrent patterns of interaction are what concerns the designer of information systems.**

- **Whenever a task is being performed for a customer, a generic sequence of speech acts occurs. It typically starts with a request from the customer, then the performer makes a promise, performs in accordance with the promise and finally reports to the customer. The customer then declares satisfaction or rejection. This generic sequence is called the conversation-for-action schema.**
- **Worker accountability and customer satisfaction are made explicit, since there is always a customer and a performer.**

Language/Action is an approach to organize work based on a communicative perspective. The Coordinator™ and Action Workflow™ are the most well known tools based on this perspective. The latter is a workflow tool used to model, design and support business processes.

The Language/Action perspective has been explored, extended, and criticized by an extensive number of authors. Here we will only give a brief summary. For a detailed discussion see Ljungberg and Holm (1995b).

Much of the critique of the Language/Action perspective is rooted in sociological and ethnomethodological traditions (Suchman, 1987; 1994; Lynch, 1995; Schmidt, 1995). The main arguments are that it provides a too simple picture of what really goes on in work, with respect to the contingent character of work practice. It imposes a categorization scheme upon a user community, ruling out that community's own categorization scheme (Suchman, 1994). Furthermore the Language/Action perspective is claimed to be based on a rationalistic view of communication, and work organization. It represents a managerial perspective, with the discipline, surveillance, and control of workers on the agenda. Using the Language/Action perspective will hence, according to it's critics, lead to increased control and routinization of work tasks. See Winograd (1994) for counter arguments to this critique.

Most of the mentioned critique is purely theoretical, i.e. it is not grounded in specific empirical studies of the Language/Action perspective in use. There exist however a handful of empirical studies and reports on experiences with the Coordinator (Bullen &

Bennet, 1990; Durham, 1988; Grantham & Carasic, 1988; Robinson, 1991). In the Coordinator the user has to explicitly state what kind of speech act he is performing when sending a mail, e.g. request, promise etc. It also keeps track of what promises have been made.

Robinson (1991) summarizes some of the earlier experiences of the Coordinator. Only one of these suggested acceptance:

“It is a good communication tool and it gets the job done by forcing compliance” (Durham, 1988)

Grantham and Carasik (1988) reported on the trial of the Coordinator at Pacific Bell, and made the conclusion that:

“it's underlying paradigms of work, failed to acknowledge the experienced phenomenon of work”.

They also found that the participants didn't share the assumptions of the designers that one should be explicit about the nature of one's utterances.

Bullen and Bennet (1990) found in their study of groupware systems, that people ignored the categories of the Coordinator and just “hit enter” to send a message.

“...we found people consistently sending each other “requests” regardless of the content of the message. Not surprisingly, ‘request’ is the first menu choice and where the cursor falls by default.” (ibid.)

In contrast to what the critics of the Coordinator as a disciplining software have argued, there seems to be room for bricolage.

Attempts have been made to overcome some of the mentioned deficiencies by synthesizing the Language/Action perspective with other approaches, e.g. ethnomethodology (De Michelis & Grasso, 1994), participatory design (Kensing & Winograd) and conversation analysis (Bowers & Churcher, 1988, Holm & Ljungberg, 1996).

3. IT and Organizational Effects

In essence, this whole discussion aims at mapping certain organizational effects to certain features of technology. To arrive at a more nuanced picture of these issues, we present a framework, identifying important characteristics of technology and work. This framework is used to discuss effects of introducing information technology to improve efficiency in processes.

3.1 A discussion framework

As an attempt to structure the discussion, we have formulated the following four questions:

- (i) What specific structures (i.e. standards and norms for work activities) are supported through the information system?**
- (ii) Which role has the information system in introducing and maintaining these structures?**
- (iii) How were these structures created? Who was involved?**
- (iv) What are the effects in the organization? What are the implications for future design situations?**

(i) and (ii) serve as intermediate points of reference when we try to relate certain technical features of the systems to organizational effects. Many of the most crucial problems with the introduction of new IT-artifacts are basically new ways of working and need to be discussed as such (Winograd and Flores, 1986). It is also important to realize that the technology is but one factor among many in the work place that affects the work conditions for individuals.

(iii) addresses issues of influence and participation of various stake holders in the design process.

Finally, regarding (iv), when we are discussing the organizational effects, we believe it is important to include the following questions:

- **How did the work situation change for the individual with respect to:**
 - possibility of influencing work performance,**
 - possibility of obtaining an overview of the overall work processes,**
 - degree of responsibility,**
 - need for competence in work,**
 - possibility to learn and develop new skills?**
- **How did the degree of coordination and control change when the system was introduced? How was the balance between routinization and flexibility affected?**
- **How does the organization adapt to the new structures?**
- **Are there problems with the system, e.g. a lack of acceptance, that can be related to the above?**
- **Could we say something about how the technology and certain design features affect these things?**

In this case, we are particularly interested in the specific way of designing and structuring work that is inherent in the Language/Action approach, i.e. using the conversation-for-action schema as a primitive design component. For this purpose, we have formulated the following questions as an attempt to identify situations where the conversation-for-action schema is applicable (Ljungberg and Holm, 1995b).

- **Is there a need for a rationalistic design of work?**
 - Is there a need for flexibility in work performance?**
 - Is there a need for flexibility as regards social roles and authority relations?**
 - To what degree do we expect cooperation or conflicts among people?**
- **What specific social roles exist?**
- **What is the purpose of communication?**

The first issue concerns general problems of design, related to the characteristics of a work situation: is there a rich utilization and development of human skills and continuous learning, rich utilization and development of social competence and responsibility, rich and diversified human interaction? If these characteristics are desirable, people must work and communicate with a certain amount of freedom. This prompts for flexibility regarding work procedures as well as social roles and authority relations. The need for openness, plurality and flexibility in the work place may hence lead to a failure both for the conversation-for-action schema and for many other design methods that attempt to rigorously structure these aspects.

Secondly, the conversation-for-action schema rests on a set of assumptions about social roles (customer and performer) and purpose of communication (to administer organizational commitments). The schema may hence fail if applied in situations with other social roles or other purposes of communication. Finally, the schema may be criticized also in situations where customers and performers communicate in order to administrate commitments.

Finally, if people are not striving for mutual understanding in communication, if there are conflicts and people manipulate each other, then taxonomies based on Searle's theory are insufficient (Habermas, 1984; Dietz & Widdershoven, 1992). Ultimately we must face the question of whether this type of communication should be designed at all, i.e. if, why, and how this type of communication should be structured and designed (Ljungberg and Holm, 1995b). One way to do this is to explore some candidate ways of communication modeling.

4. Case design and Research site

This explorative study was performed at a small Swedish company in the IT-sector, here called Beta Corporation. The company was chosen because of their advanced use of Lotus Notes (i.e. more than sharing a price list with the customers) and their efforts in

implementing the Action Workflow system. Before we found Beta we had been in contact with approximately 40 companies, none of which met these requirements. Data was collected by interviews, observation of in-house sales people in action, reading of product catalogues and brochures about Beta as well as system documentation. We made five semi-structured interviews with representatives from management, systems developers, and users. Each interview was between one and two hours in length. We asked detailed questions about the background and development history of the system, and about work routines and system usage. We looked at the entire sales procedure, which was supported by several IT-systems.

The objective with the study is to reflect on the applicability and consequences of using speech act based approaches.

4.1 About the Company

Beta Corporation provides complete IT solutions for businesses. This means providing everything from telephone systems to scheduled classes on how to use common application programs, i.e. they provide hardware and software as well as consulting services. The company is part of the ABC-chain, the country's largest chain within its field of business. Beta Corporation and the other companies in the chain order products from a central unit which also takes care of some administrative tasks. The central unit also produces various catalogues, is in charge of marketing, and generally performs functions that, if performed by each individual company, would involve much redundant work.

They have about thirty employees working within the areas of *sales, consultancy, education, in-house store, service engineers, administration, and IT administration*. The consultants work as out-of-house sales persons, cooperating intimately with customers, to try to understand customer specific needs and find solutions for them based on the products delivered by the ABC-chain. Another group of sales persons work with telemarketing. They also monitor and administer the deliveries based on the consultants' sales. Some people

work at the in-house storage. The company strives, however, to have as much direct deliveries as possible. The goods are then shipped directly to the customers from Beta's suppliers (of which the central ABC unit is the most dominating). A set of service engineers work with installations of hardware and software.

The company sold products for more than 106 million SEK in 1994, and the aim was to sell for 150 million SEK in 1995. Such an increase in sales would naturally have consequences for the organization as a whole. Usually such increases mean many new hirings. Beta, however, had in the past increased their sales (from 67 million SEK in 1993 to 106 million SEK in 1994), not mainly through hiring more employees, but through innovative use of IT to solve problems of inefficiency. Using IT to make the sales process more efficient, gives the Beta staff time to take care of their customers and develop personal relations with them. This is how they hope to reach sales of 300 million SEK.

5. Results

5.1 Background History and Objectives for Change

Several inter-related software systems supporting the sales procedure were used at Beta Corporation: one with product and price information (used by the consultants and sales persons); another supporting the generation of orders from the price list; yet another for generating installation plans; one for administrating orders to suppliers; one system for deliveries and installation jobs, and an independent bookkeeping system.

Clearly, much information was being stored redundantly in different systems. What was the reason for this? Looking at the historical development of information systems at Beta gives us the answer. Traditionally, the administrative department has done the ordinary administrative tasks such as handling invoices, orders, and various bookkeeping tasks. In taking care of these tasks, the administrative department used a set of traditional systems. Other

staff, however, did not use these systems. Instead, they had to tell the administrators what things needed to be registered. Naturally, they also had to ask many questions pertaining to what was registered. Undoubtedly, all of this telling and asking involved a lot of overhead, overhead that was very costly.

Something had to be done as the CEO had decided that Beta was to increase their sales dramatically with minimal increases in staff. Several solutions were possible. Beta decided on a safe bet. The decision was to build several new systems that could be used by the staff outside of the administrative department. The traditional information systems were kept along with newly developed applications in Lotus Notes. These new Notes applications were rapidly developed, and could easily be modified. Administrative staff still used the traditional systems, along with Lotus Notes. The idea was to keep the old systems that worked, but to allow other staff access to the new parallel systems which allowed them to do their telling and asking.

Basically the first initiative for the new system came from the group of in-house sales persons. They had visions about how to change the administration of orders and deliveries. The second initiative came from management, who suggested that the Action Workflow method should be used to introduce a process oriented way of working. The CEO was interested in business process engineering. Several of the interviewees described him as inspiring in this change process.

5.2 The Development Process

At the time of our study, the company was busy developing a new system, using Action Workflow™. This was part of the ongoing computerization of the sales process, implemented in Notes. The objectives of the new system were (from management's point of view) to introduce a process oriented way of thinking. The system should also create a global overview and monitoring of the sales process, as well as make information available for everyone in Notes.

Another goal was to improve the planning and monitoring of installation jobs. There were several problems with these routines. The planning could be better and information about current plans and installation jobs was not available to all involved people.

All in all, people at Beta hoped to increase efficiency, save time, decrease the number of mistakes and provide better customer service. Moreover, as mentioned above, management had overall goals of increasing the turnover with a minimum of new hirings, basically through better in-house use of IT. Some of these objectives were already achieved through the existing Notes applications, now information about the entire sales procedure should become available to all sales persons.

Driving forces and success factors mentioned in the interviews were:

- the fact that Beta was a small and flexible organization;**
- highly motivated staff (they even worked at home with the Action Workflow models);**
- short development times with Notes;**
- good electronic information from the central ABC unit;**
- skills in using existing Notes applications;**
- increased competition and complexity in the IT sector creates a need for overview and good information about the products.**

On the negative side, the interviewees mentioned the provision based salaries as a hindering factor in two respects. It is hard to make the consultants spend time improving the internal infrastructure. In the future there is also a need for more cooperation between different occupational groups at Beta.

Developing the Action Workflow system, the employees worked together in a team. First, they had a brainstorming meeting. Two persons then examined the material and subsequently produced a workflow map to be presented at the next meeting. None of these persons were computer experts. This procedure was repeated again and again in an open-ended iterative fashion in order to meet the requirements of the work situation.

the goods is shipped to Beta first and then it is brought to the customer at the time for installation. Information is manually inserted into the book-keeping system, from which invoices are sent. When everything is delivered, installed and paid, statistics are generated. The planning and monitoring of the consultants jobs are yet not automated.

The interviewees saw several advantages of the computerization of the work flows in general. As mentioned above, the major advantages concerned traditional effects of computerization, e.g. increased efficiency, time savings, fewer errors being made, less paper work and better customer service.

They also hoped for more qualitative changes, such as more time spent on qualified work, possibility to concentrate on the most important tasks, simplifications of administrative routines, and changes in work roles (see below).

IT was also used as a means to achieve a unified way of working. They should answer the same questions from the customers in the same way. They became less dependent on specific knowledge about products, since all information was available on-line. At the same time, there was a tendency towards increased specialization and, therefore, an increased need for cooperation between different professional categories (e.g. between in-house sales, consultants and installation personnel). There was also an increased need for in-depth knowledge about the products. One has to be able to interpret all information now available on the screen.

We asked the interviewees to reflect upon the advantages and disadvantages of the Action Workflow methodology. They mentioned that the development became less dependent on computer experts and external consultants and that users receive more control over the development, due to the conceptual design technique. Moreover, they mentioned that the system would be easy to change. This leads to less dependence on getting the theoretical analysis correct from the beginning. One can simply test a way of working and then re-evaluate this after a time and easily implement changes. They also felt it was good that the method controlled only the flows and that all important decisions could be left to individuals.

At the time of our study, the interviewees were quite enthusiastic about the development work. They had, however, some important reflections. The major problems they saw were to know on what level of detail one should model and control the processes. They also thought that introducing the workflow system might have as a consequence that the work would be controlled too strict. It was also stressed that the new system ought not to be turned into a managerial control tool over the sales persons. They also mentioned the risk with increased dependency on technology. Some felt it was confusing that the same abstraction mechanism (e.g. the conversation-for-action schema) was used for several different things. It was also mentioned that non-computer experts had trouble learning the modeling technique. It was not *that* simple to use. They were still dependent on a computer expert for instructions on how to use the method and to generate the code.

5.4 Standardization and Control vs. Flexibility in work

In general Beta is a work place with high work tempo and many routinized administrative tasks. According to the interviewees, the degree of routinization and work tempo did not change. Standardization increased in areas such as supervision of deliveries and installation. Information used in customer contacts was also standardized. IT was used here to achieve a unified way of working.

Certain areas were thought to require especial flexibility: giving offers to customers in competitive situations, discussions with customers to find new IT-solutions and finding non-standard delivery solutions in discussions with suppliers. The interviewees generally felt that there was an unchanged high degree of autonomy for the sales persons in their contacts with the customers.

A major change in work practice was that the existing routines became more efficient and simplified. There were changed responsibilities for administrative routines. These routines tended to be integrated with the tasks they supported. Instead of having a sales person handing over an order to administrative staff and then later asking this person for information, we can see two developments: (1)

The sales persons “became their own secretary”, i.e. they took care of these administrative routines themselves. (2) Persons occupied with administrative routines could be involved in activities involving more responsibilities. We can see this for the in-house sales persons. Earlier they were more occupied with supervision of orders and deliveries. These roles were expected to disappear in the near future. People in the warehouse also became more involved in customer contacts.

This, in turn, leads to less need for coordination, less people involved in one work flow, and more autonomy for the individual. On the other hand there is an increased interdependence of another, more qualified sort: more need for cooperation due to specialization.

Moreover, there was increased influence on the change process, as mentioned above, for in-house sales persons. The routines can hence be more easily managed and changed on a local basis.

5.5 Effects on Work Roles

We have already discussed some general changes, such as increased efficiency. The sales people maintained an unchanged high degree of responsibility and autonomy in contacts with customers. As a consequence of simplified administrative routines, less time was spent with administrative routines.

The *in-house sales persons*, who also worked with supervision of deliveries, spent more time interacting with customers, and less time finding information and searching for product and price information. Hence, there was an increased need for social competence in customer contacts.

Factual knowledge became less important. On the other hand there was an increased need for deeper knowledge about the products and their use. According to the interviewees, there might be a risk that they relied on the on-line information too much (rather than using their own expertise), and hence may lose valuable expertise. The high complexity of the IT-sector leads to increased specialization, which, in turn, increases needs for cooperation and social competence among colleagues. In general, the purely

administrative routines disappeared and were incorporated with more qualified work. This was also due to the increased influence on the change processes.

The interviewees also reflected on the changed work roles for the *systems developers*. Users became less dependent on them. While system developers spent considerably less time with programming, more time was spent with requirements formulation and work analysis.

6. Discussion

Our aim is to discuss the applicability of the Language/Action perspective and the possible effects of using the perspective in work redesign. Some of these reflections could be related to the debate of the Language/Action perspective (see Schmidt, 1994). Winograd acknowledges Suchman for three observations (1994). (i) Explicit representation of intentions and commitments are appropriate only in certain social/organizational situations, and applicable only to certain work structures. (ii) The people “who live the situations being represented” must participate in the generation of the abstractions. (iii) No abstraction will capture all meaning of a complex organizational situation.

These themes are close to the discussion framework, introduced earlier in the paper, and the discussion will naturally evolve around these issues. That is, how do we make a good balance between efficiency and flexibility, i.e. between routinized work tasks and knowledge intensive qualified work. Who's perspectives, should be accounted for? Which kind of abstractions should be used?

6.1 Routinization and Flexibility

In the debate on the Language/Action perspective, one issue concerns whether work will be too strictly controlled (Suchman 1994; Winograd, 1994). Arguably, this critique is related to the

standardization and routinization of otherwise free and flexible work situations. We believe this is an important issue, but it needs to be discussed on a broader basis. We have hence set out to investigate how various characteristics of the work environment are affected by various aspects of technology design and usage. The effects we studied appear, however, to be related to a complex set of features of the work environment, the kind of development method, technology design, and theoretical perspective:

- **general characteristics of information technology, e.g. the ability to process large amounts of information quickly and accurately;**
- **the use of databases to make information accessible in the work situation;**
- **the effects of implementing everything in Notes;**
- **quick development times in Notes;**
- **the abstraction mechanism and modeling technique used in the Action Workflow methodology;**
- **the ability to change the functionality of the workflow system by editing the conceptual schema;**
- **the way of thinking about technology and organizational change underlying Action Workflow methodology, e.g. to focus on customer satisfaction and to introduce a process oriented way of thinking.**

The above features are also related to characteristics of the work settings existing degree of autonomy and global control of work; existing needs for coordination and the organization of the development work.

Some of the effects concerned traditional rationalizations: increased efficiency, time savings, and less mistakes. These effects are related to general characteristics of information technology, e.g. the ability to process large amounts of information quickly and accurately. The use of Notes as a general platform and the process oriented way of thinking underlying Action Workflow method

increased these effects. They created a global view of the entire sales process and made all information available in Notes.

We have also a set of more qualitative changes in the work setting. There was an increased need for unique human abilities. More time was spent discussing with customers and colleagues. Social aspects of communication were emphasized. Factual knowledge became less important, while an in-depth knowledge about the IT-field was emphasized more. Arguably, these effects are related to the same general characteristics of the technology. Since the machines can make the routines more efficient, people can concentrate their efforts on other tasks. Needs that the machines cannot satisfy become more visible.

We have also seen a set of effects on work content and work roles. Routines become integrated with more qualified tasks. As a consequence, there is less need of coordination between people and less bureaucracy. Also, these effects are related to the above mentioned characteristics.

We can notice that the process oriented way of thinking played an important role while the focus on customer satisfaction played a less dominating role.

In understanding how these effects were achieved, we must also bear in mind that the organization was highly standardized and routinized also before the change process. People could not work independently regarding the administrative routines. The dependencies existed, but they were not managed very efficiently. Arguably, the degree of global control of the administrative routines did not change, but was made more efficient.

6.2 Who participates? Who is in charge?

Representing work is a complex and difficult task. Who's abstractions are we to use? Which people should be involved in the process? The Language/Action perspective is frequently related to BPR efforts (Medina-Mora et al., 1992; Keen, 1991). Most contemporary literature on business process redesign (e.g. Hammer

and Champy, 1993; Davenport, 1993; Keen, 1991) have an organizational, top down perspective.

Dangers in this top down perspective are discussed in Sachs (1995) and Suchman (1995). Not giving enough attention to actual work practices, and underestimating the complexity of these practices, will lead to defective process design. Examples of such failures are found in Bowers & Button (1995) and Sachs (1995). Suchman (1995) argues that "...work has a tendency to disappear at a distance, such that the further removed we are from the work of others, the more simplified, often stereotyped, our view of their work becomes." These dangers are not only concerns for workers, ending up with unsatisfactory work situations, but they will also aggravate the possibility to achieve the organizational goals, which motivated the redesign in the first place.

At Beta corporation, however, an important effect was the increased influence on the development for non-computer experts. The work routines could be controlled and managed by the people working with these routines. There was a decreased dependence on abstract analysis and the team could be more praxis-oriented. They could test a way of working and then re-evaluate it and easily implement improvements. These effects are related to a set of technological features, e.g. Notes, the conceptual design technique, the ability to change the functionality by editing the conceptual schema. Arguably, the Language/Action perspective had an important role here, since it introduces a terminology that ordinary people can relate to.

In the tradition of participatory design, and cooperative design (Ehn, 1988; Kyng, 1995), work process redesign is a concern for both the people involved in the work practice, and the designers of the potential information system. The design process is a mutual dialogue where designers learn the work environment, and users learn mechanisms for design representations and work representations (Kyng, 1995). Attempts to enrich the Language/Action perspective by including ideas from the Scandinavian tradition of participatory design have also been made (Kensing and Winograd, 1991).

At Beta Corporation, the redesign effort was not a traditional way of doing top down BPR. Neither was it participatory design. No consultants or designers were involved (except for a short introductory course on the method and tools). The work mapping and process design were user driven. The workers made the work mapping using the Action Analyst™ tool, often at their homes in the evenings. This high degree of user influence is dependent on the tool, that it is easy to use. Due to this ease, there will be a natural prototype-use iteration.

We believe that the type of company and business area we are discussing, is important in this context. Beta consisted of a small and highly motivated group that was dedicated to their company. They often worked extra at home. The business area as such is highly competitive, which creates high demand on efficient sales procedures in order to survive. This means that a certain type of routinization and a high work tempo are likely to exist in the company, regardless of what type of IT support they have. In such situations the monitoring and automated routing of documents may not lead to increased routinization *per se*, but it could make the already existing work routines more easy to handle.

6.3 Abstractions of Work

The metaphors and generalizations supporting the design task makes the tools easy to use, but they also blind the user. The categorization scheme built into any tool is constraining how people view the work processes. We can also notice that commercial interests strengthen positivistic claims such that this is the ultimate truth about human coordination.

When we asked if they found any activities not covered by the 15 speech act categories found in the manual, one of the interviewees answered

“There are only fifteen possible categories of what you can say,
It says so in the manual”

The categorization system imposes a set of constraints on the workers when they are describing and representing their own work activities. This is a dangerous form of blindness (Winograd, 1995), but it is inherent in any form of method for structuring organizations, work and information systems. This does not make it less dangerous, it is something to always be aware of and an important concern for the whole field of information systems design. It has implications when designing databases, interfaces, task support, and communication systems.

Taking multiple perspectives, and using multiple metaphors is one possible way out of this blindness. This leads to a discussion on what abstraction mechanisms and metaphors that are naturally employed in the modeling and design of organizational communication. We have not focused on this here. However, there are several issues that could be brought up in the discussion on this case, e.g. the need to integrate methods for communication and database modeling (this was mentioned during the interviews), to introduce generalizations about other situation-types besides the conversation-for-action, and to introduce an ability to edit the schema freely. Arguably, as the Action Workflow method is applied in this case, it is not natural to view all circles as customer-performer relations.

7. Conclusion

What, then, is the role of the Language/Action perspective in all the described change efforts? We have mentioned several effects. It is important, however, that these effects are discussed in a proper context: That we consider also other important features of technology and work and that we understand the role of human choices. Some of these issues involve ethical, social and political conflicts. The technical artifacts are surrounded with implicit assumptions, attitudes and perspectives. This does not however automatically load them with inherent political value.

What is actually achieved is a matter of how people choose to reorganize work. The development work at Beta illustrates a number of choices that technology confronts us with. The technology brings possibilities to integrate routines with qualified tasks. But, people can also choose to concentrate all routines on one work group exclusively. The technology brings possibilities to increase the influence of users on systems development, but it can also be used to increase global control and Taylorism. The technology brings possibilities to focus more on unique human qualities in work, but we can also choose to ignore these.

But again, the crucial point is of course *which people* that are given the authority to influence these choices.

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Fourth paper

Structures that Imprison and Structures that Free

Peter Holm^{1,2} and Jan Ljungberg³

¹*Dept. of Computer and Systems Science,
Stockholm University, Electrum 230, S-164 40 Kista, Sweden
Tel: +46 8 161684, Fax: +46 8 703 9025, E-mail: pholm@dsv.su.se*

²*Swedish Institute for Systems Development;
Electrum 212; S-164 40 Kista*

³*Dept. of Informatics, Göteborg University, Box 3147, S-400 10 Göteborg, Sweden
Tel: +46 31 773 2746, Fax: 46 31 773 47 54, E-mail: janl@adb.gu.se*

Abstract

In this paper we argue there is a need to renew the discussion of the 70s regarding the effect information technology (IT) has on skill requirements, responsibilities and learning in work life. We also argue, however, that these issues need to be formulated differently today. In its first decades, computerization strengthened rationalization efforts in industry. IT was claimed to increase Taylorism and alienation. As we move into the postindustrial society, the situation is almost the reverse. People no longer discuss “deskilling” and “dequalification of work”. Instead we encounter expressions like “user empowerment” and “the good IT-society”. We now need to reflect on how and when these concerns can co-exist, and how IT can be an enabling factor for their co-existence. By considering three cases, we want to throw light upon what important social and ethical

decisions technology confronts us with today, as to how work should be organized.

1. The risks of the 70s and the possibilities of the 90s

Issues of deskilling and learning in work life as a consequence of using new technologies, were vividly discussed during the 70s (and 80s). At this time, risks with technology and its possible negative effects on working environments dominated the debate. Early office automation efforts brought Taylorism and assembly lines to the office, followed by increased routinization.

People worried whether important skills and knowledge of certain work groups would disappear in the future, due to work automation. Would increased computerization lead to a dequalification of work, with decreased responsibility, learning and use of skills for the individual? From a management point of view these questions would not even be a problem, since the promise of the new technology was not only rationalization of numbers, but also of skill and knowledge (see (Adler and Winograd, 1992) on the deskilling myth). Information technology was first and foremost a management technology, implemented to increase efficiency and control. A deskilled workforce could be paid less and would be easier to control (Braverman, 1974).

The Scandinavian school and Participatory Design (PD) were shaped around these issues, i.e. democracy, power and control in the workplace (Ehn, 1988; 1992; Clement and Van der Besselar, 1993). At the heart was also the belief that the participation of skilled users in the design process would promote successful design and high-quality products.

In the 70s researchers were also concerned about integrity issues. The large amounts of information gathered about people in government data bases, threatened citizen integrity. Government research funding was during this period focused (via technical boards) on research on consequences of technology (compared with

the support of construction research in the 50s, and dissemination efforts in the 60s, (Henriksson, 1995)).

Looking at the 90s, the situation has changed drastically. Today we think of technology quite differently. Few authors focus on risks or negative effects of computerization (for a counterexample see Greenbaum, 1995), e.g. on possible dequalification of work. Instead they talk about decentralized network organizations and user empowerment through IT-usage. Today one would rather use information technology to upskill, to informate, than to deskill and automate (Zuboff, 1988). The most typical picture of an IT user today, is perhaps a person surfing on the net, totally free, with the whole world virtually under her feet. The discourse on IT today centers, e.g., around notions of “the good information technology”, i.e., a technology that will reduce unemployment, promote teleworking in homes, enable small innovative companies, networked organizations, et cetera (see e.g., Bangemann et al.).

1.1 What has changed?

How come technology seems to affect our lives and working conditions so differently today, compared to the 70s? What has changed? There are of course several factors involved. One of the most important factors is perhaps the rapid technological (hardware) development per se, with ever decreasing prices and increasing capacity. This has enabled high level abstraction mechanisms in programming, development of standard software systems and modular software components. Combined with the explosive development of network connections, the whole area of systems development is becoming totally reshaped. An example of the latter is the use of WWW, with standard browsers that could be easily extended by plug-ins and java-applets.

There is of course a complex set of factors affecting the rapidly spreading use of WWW. Part of it has to do with increased bandwidth and the ability to transfer pictures, sound, et cetera. This opens up for user friendly, multi-modal interfaces and easy-to-use applications. On the other hand, there are also factors having to do

with reaching a critical mass of users, the free distribution of software, and standardization.

As a result of all this, in turn, the technology becomes more flexible. Decentralized computer systems create possibilities for decentralized work. This could be contrasted with the situation in the 70s, where the use of highly centralized computer systems presupposed strictly standardized and rigid work routines. Of course, this is unavoidable in a time when an administrative system with a few kilobytes of working memory was a considerable investment also for large companies, and when system changes required several months of work for highly skilled and well-paid programmers.

All this changes creates new possibilities in design and introduction of IT in organizations. What earlier was an introduction of a new system, with a new interface, training for users, et cetera, can today (in extreme cases) be reduced to mailing a new URL address, with a username and password. The work conditions for professional designers, systems analysts, and others, are radically changing. In many areas IT-design becomes an activity inmeshed with the everyday work activities which can be made incrementally based on people's tacit understanding, while it earlier resulted in rigid structures based on abstract theoretical analyses of work.

Today there is also a trend towards even more user tailorable, and adaptable systems. As an effect, people are generally less dependent on technicians and analysts. User influence on systems design increases considerably.

Of course, all this also changes the need for research. The need for research on new development methods decreases. Instead there is an increased need, e.g., to study particular standard solutions, and their underlying perspective on the use situation.

Ironically, the above mentioned changes towards more humane technology use, are mainly driven by technological development, rather than ideologies. But, this does not mean that ideologies are unimportant. On the contrary. We should not end up in technological determinism, saying it was only the limited technology that created the routine processing and deskilling systems of the 70s. This is of course wrong. Even with the mainframes in the 70s there were design choices (Greenbaum,

1995). However, today there are more technological possibilities, and therefore many more design choices and more complex choices. When the development can go in many directions, it is more important to critically examine on what grounds work is organized, from what perspectives, in whose interest, based on what underlying assumptions, et cetera (Suchman, 1995; Sachs, 1995). We must seriously address ethical and ideological issues. We also need specific knowledge on the concrete risks and possibilities with IT in work life today.

1.2 Who meets the new research needs?

Where and how are the issues of IT and worker empowerment discussed today? How do the Scandinavian approach and Participatory Design meet these changes? Let us shortly discuss this around the three perspectives mentioned in (Kjær and Madsen, 1995; Greenbaum, 1993): a *pragmatic*, a *theoretical* and a *political* perspective.

According to a *pragmatic perspective*, the PD-approach raised from the failure of traditional methods to design technical artifacts with high quality and usability. Since the design and implementation of IT-artifacts in a work process, also is design of that work process, implications for the work process and the workers must be on the agenda. The people who perform the day-to-day work must be involved, since they are the ones who know how it is done.

Today, a lot of knowledge and value have been infused in ordinary methodologies and ways of designing systems. A body of knowledge suggests that new technology will be more effective when it augments rather than replaces skills (Winograd and Adler, 1992). A certain amount of this knowledge has spread to traditional methods, but there is still much more to learn.

The *political perspective* has strong foundations especially in the Scandinavian tradition. Taking active stands for the workers' interests, these projects aimed at empowering workers and trade

unions in the design of new technology, and to design for democracy at work (Ehn, 1988; 1992).

Today the political landscape is changed. Unions may in many cases be considered as conservative forces. In the fall of 1990 Volvos new car factory in Uddevalla was in place, designed to promote skill and learning. Work was organized around empowered teams, instead of the assembly line. When the market went down, the union of car workers at Volvo made the decision to support the closing of the Uddevalla factory. Routine work were chosen in favor of flexibility and skill.

The *theoretical perspective of Participatory Design* is founded in the philosophies of Wittgenstein, Heidegger and Schutz. Heidegger's notion of "involved action", the language games of Wittgenstein and the phenomenology of Schutz have all been used as a foundation for reflecting on practice.

Today a social constructivist view on design is more needed than ever before. More and more work and action are constituted by language, i.e., our practice resides in language.

As a general criticism of the Scandinavian School and the PD tradition, we believe there is a need to focus more concretely on the products of design (i.e., the software systems), and not just on how they have been developed. Designing IT is designing new ways of working. This, in turn, may empower workers, increase democracy, reshape power positions, increase centralization and global control, et cetera. Hence there is a need to unravel the concrete possibilities and risks with technology in today's organizations. How do modern technology and particular designs affect the working conditions for individuals? As the use of standard systems increases, we also need to critically examine assumptions on work and cooperation underlying these systems. All in all, we must look concretely on IT-designs and ways of working, rather than just focus on whether these designs were constructed in a democratic way.

In the area of computer supported cooperative work many of these issues are also discussed. In this field there is, however, a tendency to focus on free and unconstrained forms of work. (The term "cooperation" is significant in this respect. Strictly planned and controlled routines are not naturally labeled "cooperation".) A typical

example of such working conditions is perhaps the work situation of the researchers themselves. However, with this type of focus on particular forms of work, there is a risk that we disregard the work conditions for less privileged people in society, which have to accept a certain degree of global planning and control, and where IT is used as means to achieve this. Moreover, these areas are perhaps the most important ones to explore, when discussing IT and issues of democracy and worker influence.

To do design is to make choices in specific situations, and to take responsibility for what each of these choices will lead to. Today the choices are more complex, since we can do much more with technology. But what choices are there? Who is deciding which the choices are? Who is the one to make the choices? In this paper we will discuss these questions, by reflecting on three cases. What will the consequences be?

2. Three cases of IT-usage

We will now consider three cases, involving three different IT systems: a workflow management system, a standard library system, and a portfolio management system. The cases are very dissimilar regarding kind of technology, work task, and organization. We will use these cases to roughly reflect on how technology affects the working conditions of individuals regarding responsibility, learning, autonomy, and skill requirements. Case one and two are described in (Holm, Ljungberg and Hedman, 1996). Case three is described in (Bradley and Holm, 1992; Holm, 1996).

2.1 A workflow management system

The first case concerns a workflow management system supporting the ordering procedure in a small-sized Swedish company in the IT sector. The study consisted of five interviews with representatives from management, systems developers, and users. Several

interrelated systems supporting various parts of the ordering, delivery and installation of software and hardware products were included in the study.

The objectives with computerization within this firm were to increase effectiveness, reduce the number of errors, gain time, and improve customer service. Among the existing software systems we find one with product and price information, others supporting ordering, deliveries, installations, and a bookkeeping system. At the time for this study the firm was also developing a new system, using Action Workflow methodology. They wanted to create a global process-oriented overview of work. More particularly, they wished to improve the planning and monitoring of installation jobs.

The sales procedure within the firm was highly standardized and routinized, already before computerization. At the same time, there were areas where people had a high degree of autonomy and which required considerable flexibility, e.g., when sales persons made offers to customers. IT was used to make existing routines more simple and effective. To a certain extent this led to an integration of these routines with the core work activities that they supported. The sales persons could answer questions about deliveries and installation jobs themselves, and became less dependent on others for this information. Thus people working with order registration and delivery supervision could spend less time with purely routinized work, extend their responsibilities, and function more as sales persons themselves.

In many respects, there was an increased need for unique human skills. As purely administrative routines became simplified, sales persons could spend more time discussing with customers, and their social skills became more stressed. Similarly, factual knowledge about products became less important, while an in-depth knowledge on how the products are used became more needed. There was also an increased specialization due to the complexity in the IT-sector. This led to an increased need of cooperation among the sales persons to find the best solutions for a particular customer. The fact that sales persons were paid on commission were seen as a potential problem.

The interviewees felt that non-computer experts got more influence over the design process, due to the conceptual design

method in the Action Workflow methodology. Moreover, the ability to change the functionality of the system by editing a conceptual schema, was expected to lead to less dependence on theoretical analysis of work. With this method they can test new ways of working for a while, re-evaluate it and then easily implement changes. As an effect, existing work routines will become easier to control and manage on a local basis. (One of the major experienced problems with the method, was deciding on which level of detail the processes should be modeled and controlled.)

In this case, technology was used in a traditional way to increase effectiveness, to create and maintain standardization, and to simplify existing routines. However, we have also seen how such a development can be naturally combined, at least partly, with an increased qualification of work, increased need for in-depth competence, more cooperation, learning and discussions.

2.2 A standard library system

Case two concerns a system used to administer the lending routine in a Swedish university library. The study consisted of six interviews with representatives from management, people responsible for the system, and users.

The library bought and installed its current standard library system (GEAC) in 1985. At that time, the manual routines had become too slow and inaccurate to manage the constantly increasing number of customers and loan rates. Since then the system has been updated several times, to gain more capacity. At the time for this study, a group had started to formulate requirements on a new software system, to be acquired during 1996, primarily to achieve even more capacity. The major objective with computerization at the library was increasing effectiveness and reducing mistakes in work routines. In the new system, they also plan to automate more aspects of the lending procedure. Customers will be allowed to make reservations themselves. They will also buy a machine that automatically demagnetizes books, so that customers can check out books themselves, using library cards.

When the first system was installed, several small department libraries joined and formed one unified university library together. The introduction of the new software system forced these groups to unify their rules and routines for loans. This was not planned, but it was welcomed and seen as unavoidable in the long run, since it enabled future growth.

The many loans (nearly a million a year) make a high degree of routinization and automation desirable, since this simplifies unavoidable and boring routines in the library. The plan is to make the loan desk librarians' work more interesting. In the future they will focus more on giving instructions to customers on how to use various software systems in the library, and take care of troublesome cases.

The library case illustrates that increased global control of work routines is not merely a managerial interest. It comes with the very idea of running a library of today. The loan desk librarians took pride in being able to manage these routines. It was an essential part of their work skills. They must be able to set up and follow a set of rules so that all customers are treated in the same way. They must also have the skill to judge when it is desirable to circumvent these rules, to satisfy a particular customer. What happened was that increased computerization made the lending rules more complex, and more skills were required to handle them. Increased use of IT also lead to increased flexibility in changing the rules. The loan desk department had meetings every week to discuss current problems with the rules, e.g. if they needed to be changed or if the staff applied them inconsequentially.

An interesting observation concerns work roles in the library. In the GEAC-system it is possible to have a hierarchical structure, controlling who is allowed to do what. This facility was unused, and the interviewees gave several reasons for why this was so. Some arguments concerned cultural aspects. People would feel humiliated to be controlled in that way, they argued. It is also a question of learning new skills. As people advance, they gradually gain new responsibilities. In this process it is important to have flexible work roles. Moreover, they argued it is a matter of trust, that people are

allowed to make their own decisions about what they can and can not do.

Finally, the library case contains an example of so called tinkering or bricolage — people's innovative use of technology in ways unintended by the designers. Besides books, it is possible for students to borrow seminar rooms, white-board pens and computers. To administer these things, librarians have registered them in the system as books. There exists, e.g., a book in the system named "Macintosh number 24, Monday, 10 to 12 a.m.". If you make a reservation for that "book", you are allowed to borrow Macintosh number 24 in the computer room next Monday between 10 and 12 a.m.

2.3 A portfolio management system

Case three concerned a portfolio management system in a Swedish bank. The study consisted of fourteen qualitative interviews with nine end users and five persons who had helped develop the system or who had a central responsibility for the system. This case differs from the other two, in that it concerned more skill demanding tasks with much responsibility for the individual and less routinization. Moreover, the way of working supported by this system, was created and implemented in the organization for the first time when the system was introduced.

The objective with the new way of working was to increase the depot turnover by having more concrete sales suggestions. They also wanted a more unified service, with a standard analysis method based on central evaluations of companies and business sectors. The aim was to decrease the burden of responsibility for advisors in small branch offices. At the same time, their competence should be strengthened with support from the system. More emphasis was also put on the advisors' social skills when interacting with customers. The system was meant to be used flexibly, complemented with the advisors own judgments as much as possible.

Many organizational effects of introducing this system were related to new way of working. A key issue is the changed

responsibility regarding different parts of the advice service. Advantages with the system were related to increased effectiveness in the analysis work and in the “knowledge transfer” from experts at the central office to the branch offices. The analysis was made faster and broader in scope. The advisors used their time more efficient. Before the system was introduced, a set of expert answered questions on the phone. By using the system, they can communicate their evaluation of companies and business sectors and give general comments on the financial situation through the system, once and for all. The advantages were also related to a decreased focus on the advisors themselves and their work with analyses. They felt more secure when using the system. The major problems with the system were related to the same theme, i.e. increased standardization and routinization. Firstly, the “more effective knowledge transfer” from the experts at the central office led to decreased personal interaction, which some advisors saw as a problem. This was compensated through putting more emphasis on interaction with other colleagues. Secondly, the major risk with the system concerned a potential “full” routinization of the advice service, where advisor competence played no natural part. This, they argued, would lead to a loss of trustworthiness.

In this case, IT functioned as the major instrument to introduce the new way of working. It was used to increase effectiveness and standardization in a rather traditional way. This included a change of responsibilities. Notably, this did not lead to a dequalification of the advisors’ work. On the contrary, it was claimed that unique human and social abilities became more visible. The advisors’ competence profile changed, but did not decrease. The system was also used directly to increase the competence of the advisors, through frequent use of well-organized explanations and various types of information about the knowledge area. Moreover, the technology was used to change the communication patterns by introducing a standardized, computerized one-way communication channel. Several advantages with man-machine interaction over personal interaction were acknowledged, e.g. that you can give support in situations where there otherwise would be no

communication at all, that you do not take valuable time from other people, and that you can learn by playing.

There were some problems with using IT as the major instrument for organizational change. The system itself came in the foreground and the new way of working was not fully understood by all advisors. Some of them did not understand their own role, but saw the system as giving the final analysis. For some advisors this resulted in an initial low acceptance of the system.

3. Designing work in the information society

Let us now make some general reflections on all three cases. The interviewees were asked to reflect upon the major advantages and disadvantages with their systems. Their spontaneous comments were largely concerned with problems and opportunities with new ways of working, e.g., the problems of creating new work roles with a reasonable degree of responsibility, needs for skills, and a balance between flexibility and effectiveness. From this we can conclude that IT development and organizational design are intrinsically intertwined and cannot be separated. The major concerns during development and introduction of the systems were not simply a matter of finding appropriate software support for existing ways of working, but evaluating and changing existing norms and standards for work activities.

Can we say something particular, on the basis of these three cases, about how introducing of certain types of IT-artifacts affects the balance between organizational effectiveness, control and routinization, on the one hand, and flexibility, learning, usage of skills, social responsibility, and rich human interaction, on the other hand? What are the important social choices technology confronts us with in information society? We can hardly make far reaching generalizations, but we may reflect on some important factors to consider, when trying to re-organize work through the introduction of new IT-artifacts.

3.1 Routinization OR flexibility

In many situations there exists a trade off between increased effectiveness, routinization and standardization, on the one hand, and increased responsibility, usage of skills and learning for the individual, on the other. This is the traditional way of thinking about computerization and office automation. It has relevance also today. Often there is a price to pay for using computer technology. Consider the portfolio management system. Standardizing the communication channel between experts and advisors had certain positive effects. One question could be answered once and for all, instead of having thirty advisors asking it at different times on the phone. On the other hand, a set of other qualities in this communication was lost, but the bank accepted this as a reasonable “cost” for the system.

3.2 Routinization AND flexibility

In all three cases, computerization was related to a traditional concern for global control, increased effectiveness, reduction of errors, and standardization of work. So, on one level it seems as if IT naturally aligns with a rationalistic and Tayloristic way of planning and structuring work. Yet, the use of IT did not lead to a dequalification of work, as one might expect according to the above mentioned traditional way of thinking about computerization of work life. Why?

We would like to suggest the following discussion points, to highlight certain aspects we believe are relevant to consider in this context. They are formulated as possibilities and not as general statements about the cases. (i) - (iv) illustrates how the traditional trade-off can be reduced, while (v) - (x) illustrates how a concern for effectiveness, global standards and control can co-exist with a concern for flexibility, user empowerment, increased skill requirements and learning for individuals, through the use of IT:

- i *Routine tasks need not be concentrated on one work group exclusively.*

This is illustrated in the workflow management case. When the administrative routines became simplified, the administrative staff was not overloaded with more routine work, but could spend more time doing more advanced and interesting things, e.g. interacting with customers. In the library case, the policy was not to increase routinization for a small set of librarians. Instead they tried to find new roles containing a reasonable mix of pure routine work and more interesting tasks.

ii There may exist ways to compensate for lost qualities of work.

This is illustrated in the bank case, where a decreased interaction with colleagues in one area lead to a spontaneous increased interaction in other areas. The objective was to standardize communication between experts at the central office and advisors at the branch offices. This can be seen as a traditional rationalistic approach, which had the side effect that important human qualities in the communication were lost. For example, the advisors no longer received feed back on their own ideas. This was compensated for, however, by advisors' attending district meetings more often, where they could discuss various matters with other colleagues.

iii Needs that the machines can not satisfy may become more visible and seen, as an effect of technological development. The risk that they are reduced is not a technical problem but a social choice.

While technology simplified technical, analytical, bureaucratic and administrative details of work, there was an increased need for and use of unique human abilities. People now spent more time doing more interesting things. They were able to engage more in discussions with customers and colleagues. Thus, social aspects of communication were more stressed.

The bank case is the most obvious example. The advisors became helped with calculations and the rational/cognitive part of the analysis. However, since computers have no empathy and can not understand unique customer needs, these aspects were more stressed for the advisors.

There are more examples of this sort, regarding the workflow management case. When specialization increased, new needs for personal cooperation emerged. A set of administrative routines became simplified in the customer contacts. As a consequence, discussing more with customers became possible. Moreover, factual knowledge could be presented on the screen whenever you need it. Hence you do not need to memorize all details about the products in this firm. Instead in-depth knowledge became more important, so that you understand the information presented to you.

iv Increased standardization and decreased responsibility can sometimes be desirable for all parties and result in better self confidence, better usage of skills, and increased competence.

This applies to the portfolio management case. Increased standardization and decreased responsibility for advisors was one objective behind developing the system. At small office, it was a heavy responsibility for advisors to take care of large customer portfolios, with little time for learning and training within the field.

v Introducing IT does not necessarily increase routinization and standardization, but may simplify already existing routines and standards.

This applies primarily to the workflow management case. Arguably the degree of routinization and standardization did not increase in this case, but existing routines were simplified. The interviewees felt that there existed interdependencies and needs for co-ordination that were ineffectively administered.

vi Technology brings opportunities to integrate several tasks, which may increase autonomy for the individual and lessen the need for coordination and bureaucracy. Administrative support functions can, e.g., be integrated with the tasks they support.

In some areas, the simplification of administrative routines made it possible to integrate them with the core work activities they supported. This lead to less bureaucracy, since fewer people became

involved in the administration of one particular task or workflow. This applies to the workflow management system, where the traditional role of order supervisor was expected to disappear in the near future. The sales persons had direct access to all information they needed through the system.

vii Increased standardization and routinization can make it possible for individuals to deal with more complex work processes and hence more skill demanding tasks.

This applies to the library case, where computerization led to increased complexity in the lending policies. The work in the loan desk became so specialized that the other staff could not easily work extra there for shorter periods, as they had done earlier.

viii Standardization and routinization in one area may lead to flexibility in another.

This is a more general point. (ix) - (x) can be seen as specializations of it. One example has to do with the advisors' work at the bank. The analysis method became more standardized. This relieved the advisors from a set of details in the analysis and they could spend more time on learning, reading the general comments on the financial situation, and gaining an overview of the advice service.

ix Even though standard ways of working are routinized, responsibilities and skills may still be needed for exceptions and informal, non-standard ways of working.

A good example is the library case. The librarians were supposed to spend less time with the normal lending procedure in the future, since they planned to introduce an automatic lending machine. The librarians should instead spend more time on instructing customers on how to use the various technologies in the library, and assist them in troublesome cases.

The bank case illustrates this in a quite different way. Here exceptions were involved *every time the system was used*. It automated certain calculations that need to be done. However, there

remained a set of factors not covered in the analysis, that must be judged by the advisors and discussed with the customer.

- x A flexible usage of IT can make existing routines easier to change and manage on a local basis by the people actually working with these routines.*

This applies to the workflow management case. Concrete technological features played an important role here, such as the ability to update a running system through the graphical manipulation of a conceptual process schema. This also applies to the library case. When using IT, changes in the lending policies can be implemented easily and quickly. People are reminded through using the technology. The ability to administer the existing work routines was a part of the required work skills of the librarians, in which they also took great pride.

4. Concluding remarks — social choices in IT-design

In this paper it has been argued that there is a need to renew the discussions of the 70s regarding the effect IT has on skill requirements, responsibilities and learning in work life. However, these discussions also need to be formulated differently today.

We have tried to highlight certain possibilities when designing work through IT. We would like to end with a reminder that none of these possibilities are caused by technology alone. Instead it is a matter of *how people choose to reorganize work*. Technology brings possibilities to integrate routinized work with more qualified tasks, but people can also choose to concentrate all routines on one work group exclusively. It brings possibilities to increase the influence of users on systems development, but it can also be used to increase global control of the change process. Technology brings possibilities to focus more on unique human qualities in work, but people can also choose to ignore these and accept a dequalification of work.

4.1 Exchanged positions in the postindustrial society?

So far we have focused on particular work situations. Moving to a more general and social level, other questions open up. If we really should take seriously the claims that we move into a knowledge-intensive society with (even) flat(ter) organizations and highly responsible individuals working in small flexible groups, then we will face totally new problems.

Maybe we will have new Scandinavian unionized projects in the future, defending the right for routine work, et cetera, shielding their members from BPR consultants who require the workers to learn more, become more flexible, take more responsibilities, et cetera. Maybe CSCW will be replaced by research on Computer Supported *Un*cooperative Work, where the strive is to create computer support for alienation and quietness.

To a certain extent this debate is already here. With the high unemployment in Europe, there is a re-evaluation of routine work. It can play an important social role in helping unemployed and untrained people getting their way back to work life. In the Swedish blue color worker union (LO) there is currently a debate on future requirements on their members, with respect to administrative responsibilities and increased use of IT.

4.2 Future research

However, to claim that the positions are simply exchanged, is too simple. Rather our conclusion is that there is a need for future studies and theorizing on particular ways of working with particular IT-designs, e.g. standard software packages, where both old and new social structures needs to be questioned, evaluated, motivated and understood in new ways. This must be done with an open eye to the complexity of the situation of today, trying to identify which design choices and possible futures there will be.

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Fifth paper

Organizations and Conversation

Jan Ljungberg

Department of Informatics, Göteborg University, Box 3147,
S-400 10 Göteborg, Sweden; E-mail: janl@adb.gu.se;
Tel: +46 31 773 2746; Fax: +46 31 773 4754

Abstract:

In this paper it is claimed that organizations are mainly constituted by communication, and that work is becoming inherently communicative. The question is how we could articulate this view in IT-design. Theories of communication and organization are aimed at understanding and interpreting organizations, and seldom address design issues. The theories of organization and organizational communication most exploited for design are characterized by an instrumental/rationalistic perspective on communication. In this paper I argue that one of the potentially most beneficial concepts to introduce in organizational communication, is a design oriented analysis of genre. Genres of intranets are discussed to exemplify.

Keywords: Genre, Discourse, Organizational Communication

1. Introduction

In the industrial era, workers and servants were supposed to shut up and do their job; they shouldn't engage in casual conversations with colleagues at work. Professional communication was restricted to formal channels, and served as a managerial instrument for control in firms as they grew in complexity (Yates, 1989).

Today all this is changing. In the realms of service production, work itself becomes inherently communicational. An increasing

amount of informal communication is taking place, playing an important role in the coordination of work and organizational processes (Kraut et. al., 1990; Sachs, 1995). Conversations with customers and with colleagues, to coordinate and to learn, is one of the main resources in the postmodern organization. The means in terms of technology, media and channels to bring about this communication are now dramatically increasing with the explosion of multimedia and the web.

This parallels with the postmodern focus on the role of language, and the linguistic turn in organization theory, i.e. that organization is generated by everyday talk and text. Organizational structure is enacted and constituted by communication, and conversations among organization members are continuously shaping and reshaping social structure, i.e. creating organizing (Mumby, 1988; Boden, 1994; Taylor, 1993).

However, most of contemporary IS-theory is still built upon mechanistic notions of organizations, processes and work, assuming that organizational knowledge is fully analyzable and that unlimited rationality is guiding behavior (Ciborra, 1993). While, IS-theory is dominated by functionalistic approaches to communication, current theories of organizations and organizational communication draw a more complex picture.

2. The Linguistic Turn

Since the 1980s there has been a change in focus within organization theory. The construction of organizational reality, through utilization of linguistic and cultural representations, has become a central concern (see e.g. Gergen, 1992; Reed & Hughes, 1992). This move is something of a linguistic turn in organization analysis, i.e. the view of language as a symbol system that is socially and culturally constructed, and its role in organizational action and organizing has become central. Inherent in this linguistic turn is that communication is grounded in action, not in information transmission. Meaning is produced in communication and interaction, not transported (conveyed) through communication (Mumby, 1988) as in the pipeline models of communication (Shannon & Weaver, 1949). Meaning is neither the product of individual

interpretation nor an objectively existing entity outside of social interaction (Taylor, 1993).

This turn is not reflected in the area of information systems, where a mechanistic “modern” view is still prevailing. Two ideas of language and communication have had a large influence on the modern view of communication.

The first is the focus on the language system (*langue*) originating from Saussure (1916) and Chomsky (1957), i.e. language viewed from a structural perspective, focusing the words in the language system and the grammatical structures in combining the words. Saussure proposed that the language system (*langue*) was more important than its use (*parole*), and Chomsky held a similar standpoint in arguing for the existence of a universal grammar. Related to this is the focus on the referential function of language.

The second idea is that human communication is a process of information transmission. The modern view of communication in organization theory and organizational communication is rooted in the “pipeline” theory of communication based on a sender-message-channel-receiver model. This view was developed by engineers with an interest in information transmission and the design of efficient channels (Shannon & Weaver, 1949). The pipeline model sees “irrationality”, “inefficiency” and “dysfunctional organization” as a result of the intrusion of unwanted non-informational aspects of message processing, i.e. “noise”.

For the modernist, language pictures reality, and is simply a tool for the representation of the essentials of reality (Gergen, 1992). The entire empirical apparatus is aligned with the traditional assumption that language is a path to nature, presuming that with sufficiently rigorous research, we may rectify language with reality. The referential function of language is naturally emphasized.

For the postmodernist, language gains its meaning and significance through its placement within social interchange. Sense-making is a collective manifestation, requiring the coordinated participation of at least two persons (Gergen, 1992). This means that meaning emerges out of interaction, and is collectively shaped in a community. Communication is thus not simply the vehicle for information, but rather the very process of organizing (Mumby, 1988).

These alternative views to functionalism are mostly found in interpretive and cultural perspectives on organizational communication (e.g. Mumby, 1988; Putnam & Panakowsky, 1988), focusing shared meaning as forming organizations.

Common for these perspectives is the view that communication (i.e. talk) is constituting organization (e.g. Boden, 1994 and Taylor, 1993). Conversation is a means to realize coordination, and thus making organization a reality, i.e. conversation generates organization (Taylor, 1993).

“The implementation of an organizational design, complete with structure and system, does not determine the organization. What it does is to create a set of circumstances. The actual organization emerges out of interaction.” (Taylor, 1993, p. 214)

Organizational work becomes a matter of symbol manipulation and information exchange (Orlikowski and Yates, 1994).

“...the genres through which information is shaped and shared for particular purposes (reports, spreadsheets, meetings, teleconferences. etc.), are no longer an aspect of organizational work; rather they are the organizational work.” (Orlikowski and Yates, 1994, p. 4)

2.1 Organization and communication at micro-level

One part of the linguistic turn, stems from micro-level studies of talk in action (Boden, 1994). Studying organizations at micro-level we focus on the actions of individuals and how these become interstructured and organized, i.e. the process of organizing.

Ethnographical approaches are perhaps the most common way to study individuals in immediate interaction at micro-level. Here the study stays close to observed data and concerns how organizing emerges out of the social fabric of interaction, i.e. by local, situated interaction between individuals.

The ethnomethodological approach is characterized by emphasis on a situation-specific frame of reference and on cognitive

sense making (Pfeffer, 1982). Social processes and situations are emphasized, but there is less attention to elements of culture such as symbols, myth, ritual, ideology, belief, language, and more emphasis on accounts for events by individuals using their own cognitive resources within a social context. The concepts derived from conversation analysis, i.e. *turn taking*, *adjacency pairs*, *repair* etc. are all related to the structuring of local, real time interaction between individuals.

There are, however, several studies of interaction in formal and institutional settings, often focusing on how turn taking is regulated by the institutional context (Drew & Heritage, 1992). These studies generalize over particular speech events and their context, e.g. interaction in court rooms and consultancy rooms, and rise over the micro-level.

In the ethnomethodologically influenced approaches to linguistics, such as ethnography of communication and conversation analysis, there is however a tendency to emphasize the local character of spoken interaction, and not take the stabilizing influence of social institutions and activity practices into account (Allwood, 1995). Boden for example draws heavily on the transcriptions of recorded speech, to show how organizing takes place. Ethnography is an important instrument to unfold practice, but it is only one instrument.

2.2 Organization and communication at macro-level

At macro-level the total organization is addressed, e.g. structuration processes, context and interaction with the environment. If micro-level is tied to action, macro-level is tied to structure. At the macro-level we might ask such questions of behavior in organizational settings as (Scott, 1995): Do behavior reflect rational interest and conscious choice, or is it primarily shaped by conventions, routines and habits? How do laws, rules and normative systems arise? Why do individuals conform to institutions? How do cultural beliefs shape the operations of organizations?

“Institutions consist of cognitive, normative, and regulative structures and activities that provide stability and meaning to social behavior. Institutions are transported by various carriers – cultures, structures, and routines – and they operate on multiple levels of jurisdiction.” (Scott, 1995, p. 33)

Language itself is perhaps the most profound example of an institution and viewing communication from a macro-level means focusing on the structure of language (*langue* or language system).

2.3 Organization as talk

Organizational communication occurs in two modes, *conversational* and *textual*, i.e. talk and text. By treating talk as central to what organizations are, Boden (1994) tries to show how atomic events such as turns at talk embed and enact organizations and institutions. Talk is action, talk is local and situated, inseparable from events of speech. The organizing qualities of organizations are located in the organization of talk. Talk both shapes and is shaped by organizational structure.

“It is through the telephone calls, meetings, planning sessions, sales talk, and corridor conversations that people inform, amuse, update, gossip, review, reassess, reason, instruct, revise, argue, debate, contest, and actually constitute the moments, myths and, through time, the very structuring of the organization.” (Boden, 1994, p. 8)

All kinds of executives, administrators and workers generally show a strong preference for verbal media and informal information settings (cf. Minzberg’s managers 1973). This indicates according to Boden (1994, p. 209) that this kind of verbal sociability will remain central to organizations in the future. But taking this perspective requires a broad view of talk. Boden argues that text is based on talk:

“Reports, long before they are typed, bound, circulated and left to collect organizational dust, are verbal affairs, produced interactively within one's own group or department and occasionally across departmental or organizational boundaries.” (Boden, 1994, p. 140)

The view of organizations as talk, is mainly rooted in an ethnomethodological tradition. Conversation analysts claim that the fundamental mechanisms of social structure are to be found in discourse. Closely observing local talk of participants in immediate interaction with each other, they typically study recorded telephone conversations or videotaped face-to-face meetings, identifying phenomena that repeatedly appear at micro-level in conversations (Bazerman, 1994a). They trace the enactment of organization and the production of organization by letting micro data “speak” (e.g. Boden, 1994).

2.4 Organization as text

Following the post-modern interest in text and narratives (see e.g. Czarniawska, 1997), we could do it the other way around, and use text as a metaphor for organizations, i.e. reading (and writing) an organization. While talk is action, text is structure: text detaches meaning from the event (of writing, Ricoeur, 1976). Text also disconnects the mental intention of the author. Meaning arises from interpretation of the text in an institutional context, and texts in organizational settings are closely related to practice.

Organizations are constantly generating texts: memos, speeches, plans, interviews, policy documents. In viewing an organization as text, we would take a broad view of what a text is and include more than written text, e.g. meetings, telephone conversations and other spoken interaction etc. Texts thus constitute organizations:

“Stories, myths, rituals, and language use [...] are not simply reflections of organizational meanings; they are the ongoing processes that constitute organizational life”. (Putnam, 1983, p. 40)

These texts are often collectively “written” through conversation, i.e. as communal texts (Taylor, 1993). They are also intertextually linked in a web of documents, resembling fragments of a “historical discourse” within the organization, i.e. interacting with past, present and future texts (Devitt, 1991). As such these texts have the power to be a foundation of the constitution of organizations (Doheny-Farina, 1991).

As empirical studies have shown, documents are integral to socially organized patterns of work, they are organizational objects and as such they represent and display organizational activities (O'Brien, 1996). Documents are also sedimentations of an organization's activities. They are shared and implicate procedural action. The import and sense making of documents rely on local organizational knowledge.

Policies and plans serve as the basis for future action, functioning as a symbol for authorities and stockholders (Doheny-Farina, 1991). They also function as resources for future action.

Documents are often *collections of data*, reports of organizational activities that is the foundation of future action and planning. They could be the basis for evaluation of products, and they could be the foundation of the business as such. Pharmaceutical companies for instance, are in the business of producing drugs, i.e. a heavily research oriented business focused at finding active substances with a positive effect on diseases. In terms of effort however, most of the time is spent on documenting research data on different groups of patients. Thus, the fundamental outcome of the pharmaceutical industry is not drugs, but the production of reports (NDA - New Drug Applications) fulfilling the requirements of national authorities

Documents as *descriptions* is perhaps the most common "product" of documental work, e.g. manuals, tutorials, specifications etc. (manuals and tutorials may be seen as a textual version of helpdesk). These documents – like the books in a book shop or at the library – are treated as merchandise to be sold or to be lent.

Documents could also be *regulating behavior* as in the case with legal documents, i.e. the document (e.g. the law) is a symbol of institutional rules, norms and power.

Documents are also *symbols for knowledge* - scientific articles or doctoral dissertations are perhaps the kind of documents most associated with knowledge. The place mostly associated with knowledge – the library – is a place where knowledge resides in texts, and not in conversation, i.e. verbal conversation is abandoned.

Documents have been and are – in the realm of paper – closely related to physical artifacts, requiring resources in terms of space and time (for filing, searching and retrieval).

Documents also act as mediators, i.e. as an instrument for coordination and division of labor.

In the modern world, most activities are deeply implicated with enduring written texts and systems of texts that provide a conservative, reproductive force on local activities. Every event becomes then potentially accountable to a wide range of textual discourses against which the action is inspectable (Bazerman, 1994a):

“Are the boss’s comments consistent with state and federal law, the company’s policies and mission statement, the union contract, the current year’s business plan, good economic reasoning expressed in text books, the current operating budget, demographic reports on the customer base, the moral teaching of her religion, current concerns being exercised through investigative newspaper stories, and last week’s memo from the company personnel office?” (Bazerman, 1994a, p. 5).

2.5 The blurring of text and speech

The introduction and fast dissemination of new electronic media for communication, has led to an emerging mixture of textual strategies with modes of spoken discourse. The distinctions between text and talk as we know them are slowly blurring. Textual interaction such as email conversation is “talk-like” in its form. Speech is also currently integrated in computer environments by ICT (Integrated Computer Telephony), where both textual discourse and speech is handled. Another important effect is the increased level of abstraction when we are able to manage and handle discourse. The written word gave us a possibility to abstract about the word and sentence, computer mediated communication is now giving us the possibility to abstract on the interaction and discourse. This blurring of modes, goes more in the direction of talk influencing text, than the other way around.

The influence of oral mode was described by one of the participants in the study of Orlikowski and Yates (1994), like this:

“Electronic mail feels halfway between writing and speaking....One thinks of having a conversation. It feels like interaction--like speech--interactive and informal. [It also feels] like writing where you have the opportunity to think about the message and edit it.” (Orlikowski and Yates, 1994, p. 13)

3. Genre theory

According to Websters Third New International Dictionary a genre is a “distinctive type or category of literary composition”. Genre has its roots in folklore, literature and rhetoric studies. In linguistics genre is closely related to speech events, i.e. activities that are directly governed by rules and norms for use of speech, and forms of talk (Levinson, 1979). Thus, genre includes both types of speech events and written text, i.e. it is a classification of types of generic forms of spoken or written discourse

A genre is a class of communicative events characterized by some shared set of communicative purposes. Recipes, for example is straightforward instructional texts, designed to ensure a gastronomic outcome. Examination and cross-examination of witnesses carried out by lawyers in court are structured to elicit the facts of the case (Swales, 1990). Human beings organize their communicative behavior partly through a repertoire of genres.

Genre is a way to bridge the traditional macro-sociology (roles, norms and classes) with recent micro-sociology.

“Genre provides a means for individuals to orient to and enact situations in recognizable ways with recognizable consequences and thereby establish a concrete mechanism for structural theories.” (Bazerman, 1997b, p. 6)

Genres evolve over time through reciprocal interaction between institutionalized practices and individual action (Yates & Orlikowski, 1992).

The concept of genre is also a way to handle the blurred distinction between speech and text, i.e. a genre of organizational communication is a typified communicative action with an identifiable communicative purpose and form occurring in certain media. The purpose is constructed and recognized by the relevant discourse community.

3.1 Discourse communities

In genre analysis we focus on how language is used within a discourse community, e.g. a group of people linked together by occupation, working premises, special interests etc. Like all definitions of community used in the social sciences, it includes a dimension of shared knowledge, possessions, or behaviors. A discourse community recruits its members by persuasion or relevant qualification (Swales, 1990), as distinct from a speech community (Saville-Troike, 1982) which typically inherits members by birth or adoption.

Swales (1990) proposes six defining characteristics which will be necessary and sufficient for identifying a group of individuals as a discourse community. Thus a discourse community:

- has a broadly agreed set of common public goals
- has mechanisms of intercommunication among its members
- uses its participatory mechanisms primarily to provide information and feedback
- utilizes and possesses one or more genres in the communicative furtherance of its aims
- has acquired some specific lexis, i.e. a specific nomenclatures for certain genres
- has a threshold level of members with a suitable degree of relevant content and discursual expertise

3.2 A Framework of genre

Berkenkotter and Huckin (1995) present a useful theoretical framework constituted by five principles of genres: *dynamism*, *situatedness*, *form and content*, *duality of structure*, and *community ownership*.

Dynamism – Genres are dynamic rhetorical forms, developed from actors' responses to recurrent situations. They stabilize experience and gives it meaning and coherence. Genres change over time in response to their participants needs.

Situatedness – Our knowledge of genres is embedded in our participation in the communicative activities of daily and professional life (Berkenkotter & Huckin, 1995). Genres emerge out of praxis. “The fundamental justification for a classification of occasions must be that the participants orient towards it.” (Wilson, 1991) The knowledge and expertise of genre is also closely related to the interactions with other members of the discourse community.

Form and content – Genre includes both form and content, i.e. what form and content is appropriate for a certain communicative purpose, in a particular situation, in a particular discourse community. Content or substance refers to the themes, topics and social motives expressed in the communication. Form refers to the physical and linguistic features of the communication (e.g. standard forms for travel expense reports, templates for budget reports etc.). Yates and Orlikowski (1992) mention three aspects of form: *structural features*, e.g. text-formatting devices and devices for structuring group interactions as agendas etc.; *communication medium*, e.g. pen and paper, face-to-face, telephone etc.; and *language or symbol system*, e.g. professional vocabulary or legal jargon. In viewing organizations as language systems, the amount of overlap and common understanding of language, i.e. common ground (Clark, 1992) becomes an important issue (communication comes etymologically from *communicare*. to make common or shared).

Duality of structure – Berkenkotter and Huckin (1995) use Giddens (1984) concept of duality of structure to relate genre to structuration processes (structuration theory is also the basis for Yates and Orlikowski, 1992). When we engage in organizational or disciplinary genres, we constitute social structures and simultaneously reproduce these structures in professional, institutional and organizational contexts. Genres emerge out of practice and at the same time shape they that practice, structure is both medium and outcome for the reproduction of practices.

Community ownership – Genre conventions reflect a discourse community’s norms, ideology, epistemology and social ontology. Understanding a genre is closely related to understanding the community “owning” it.

3.3 The link to speech acts

The structurationist account of genre provides a means of analysis of the social and institutional conditions of speech acts, avoiding the abstracting and decontextualizing tendencies of Searle's analysis (Bazerman, 1997a). Despite the fact that speech act theory is not empirically grounded, Berkenkotter and Huckin (1994) view it as a useful analytical framework for describing the moves actors make in peer review correspondence.

Peer review correspondence is conducted within an institutionalized textual sequence, i.e. an institutional unit more or less determined by tradition. The genres through which scientific communication is conducted are constituted through language users' illocutionary acts as they participate in the discursive activities of their communities. Language users invoke and reproduce disciplinary norms in drawing on rules-for-use in performing illocutionary acts (ibid.). This is related to principle 4 in the framework above, duality of structure.

Bazerman (1994b) analyzes the patent institution by drawing on the concepts of connected sets of genres, intertextually-linked documents and speech acts. The two related genres, patent application and patent grant, he views as classic speech acts as described by Austin and Searle. These documents have a stable and recognized illocutionary force within the legal system. The patent application is a *directive*, i.e. it is an attempt to direct another's behavior. The patent grant is a *declarative*, i.e. announcing or declaring certain facts makes them come true.

If one's application for a patent meets all the conditions for a patent (cf. Austin's felicity conditions), then the application will be a success.

There are many difficulties with speech act theory as discussed by Ljungberg and Holm (1996), and also recognized by Bazerman (1994b). One of these difficulties in Bazerman's endeavor is applying speech act theory to long, complex written documents, such as the patent applications and grants. A text normally contains many acts with different illocutionary force. This difficulty can be dissolved, however, if the text as a whole is distinctly identifiable as of a single genre, a single recognizable overriding illocutionary force. According to Bazerman (ibid.) such actions may correspond to Searle's five

categories of speech acts (1979), i.e. when the text effects a law (declaration), or makes an application (directive), or contractually binds you (a commissive), or presents a scientific claim (assertive), or conveys outrage in response to governmental action (expressive).

Bazerman (1994b) argues that it is possible to avoid Searle's attempt to bind the particulars of action to general principles turning acts to logical calculus, while still learning from Searle how rigorous systems of action may be realized.

In such systems of genres, the humblest ones (e.g. sales receipts) have some relationship to the larger structuring texts of society, like tax laws, corporate records, financial reports and plans (Bazerman, 1994a). Thus, speech acts could be used to articulate the web of intertextually linked documents in institutional norm systems.

3.4 The link to conversation

Genre is a rich resource with many dimensions, helping us to locate our discursive action in relation to highly structured situations. By a closer linkage to conversation analysis, ethnomethodology, and other forms of discourse analysis, genre analysis can play a major role in the investigation of the communicative grounds of social order (Bazerman, 1997a). By linking genre to conversation, we could articulate the interactional forms of genre, dialogue and conversation.

Larger recognizable units of turn sequences, e.g., a joke, could be viewed as a genre (Bazerman, 1997b).

4. Genres of organizational communication

Yates and Orlikowski introduced the notion of genre of organizational communication to be applied to typical communicative practices going on in organizations. A genre of organizational communication is a typified communicative action invoked in response to a recurrent situation (Yates & Orlikowski, 1992). It is seen as a way and a means to accomplish social actions in particular recurrent situations, i.e. with similarities in purpose, audience, form etc. The recurrent situation

includes the history and nature of established practices, social relations, and communication media within organizations. A genre is rooted in and emerges out of a social practice. When companies grew at the end of the last century, new genres of communication were developed in managerial practice as efficient mechanisms of control (Yates, 1989).

The evolution of the business memo genre is traced from the business letter genre early this century. The birth of the memo genre was a response to institutional changes (larger companies, new management philosophies), technological changes (the typewriter and the filing cabinet) and social pressures (mandates from upper management, development of new customs in new professions such as the typist) Orlikowski (Yates, 1989; Yates & Orlikowski, 1992).

Typical examples of genres of organizational communication are memos, rule books, project meetings, agendas etc. In contrast to e.g. speech acts, the purpose of a genre is not rooted in an individual's intention and motive for communication, but is recognized and reinforced within a community (of practice).

Orlikowski and Yates (1994) used the notion of *genre repertoire* to describe how knowledge workers collaborating on a large project, mediated their work and communication by a shared set of genres. A genre repertoire designates the set of genres enacted by groups, organizations, or communities to accomplish their work. It serves as a social template for shaping how, why, and with what effect members of a community interact to get their work done. In the study of a project aimed at developing a standard for the LISP programming language, a genre repertoire of four basic genres were found: the memo genre, the proposal genre, the dialogue genre, and the ballot genre (ibid.). The concept of genre repertoire offers a powerful way to understand work practices and interaction norms.

4.1 Intra-organizational genres of communication

Yates (1989) describes how formal internal communication emerged as a control mechanism in response to firms growth early in this century. In the systematic management of growing American railroad companies, written documentation was increasingly demanded to provide consistency, exactness and documentation. This demand

formed two broad main categories of genre: *downward communication* and *upward reporting*. As companies grew, the oral channels of communication became too limited, and sets of new genres for internal communication emerged. Downward communication was an important means to communicate down the hierarchy and implement executive plans and decisions. Manuals and circular letters was invented to circulate rules, norms and individual instructions down the hierarchy. Together they played the role of communicating organizational policy and embody organizational memory. Interestingly these two aspects are the main focus when establishing “Intranets” in organizations today.

4.2 Intranets – new media, channels and infrastructure

Two of the most important technologies of the nineties – for connecting people in organizations – are Lotus Notes and intranets. These two phenomena have provoked an extreme interest from industry, and both have in periods almost been fads. That stage has now passed. These phenomena have already had a large impact on communication and communication praxis in organizations. They provide a new kind of infrastructure, new channels and media, that will enable new forms and genres of organizational communication.

The first organizations to create internal webs included Lockheed, Hughes and SAS Institute, at some point these corporate webs were called intranets, a term that has become widely spread and accepted. According to *Computerworld* (June 10, 1996) the press mention of the word intranet accelerated from 28 in 1994, to 554 in 1995, to 5,737 in 1996.

Projects of early adopters of intranet-technology, typically started as small informal pilots driven by enthusiasts, with no official status from management or from the IS-department. No or little time was budgeted for managing the service. These grassroot intranet-projects quickly ran into “uncontrolled” diffusion of use and grew in unexpected ways, up to a point when management and/or IS-departments got worried and intervened.

One example is the successful intranet at National Semiconductor Corporation (NSC). It was an unplanned, bottom-up

exercise, driven by the technical library. Their problem had for several years been that creating technical documentation that all employees could access from their Macs, PCs, UNIX work stations was a massive endeavor. In 1993 copies of Mosaic were passed around from hand to hand. Buying a server to manage internal information at the library was the beginning of the corporate intranet, which evolved without any support or approval by top management.

When management became aware of what was going on they were skeptical; the free-form information sharing ideal held by Internet- and UNIX-communities, was foreign to managers. They preferred their system highly structured and carefully controlled. They had to be convinced that no corporate secrets were being disclosed, that security functioned, and that low cost and high speed of information access was a good thing.

Today, intranet-strategy is becoming an important issue for top management. The potential uses of intranets are almost unlimited, but some common uses include (Hills, 1997): e-mail, newsletters, manuals, training, job postings, memo, newsgroups, sales reports, financial reports, customer information, marketing information, product information, supply and component catalogs, inventory information, workflow, groupware etc.

However, if we look at early adopters of these technologies it is not surprising to see that many of them at first map the existing forms of “bureaucratic” communication.

The available case documentation on intranet implementation and use is still very scarce. Most “cases” focus technical aspects, and are mostly “short stories” told by vendors or implementing organizations.

4.2.1 Reproducing genres of downward communication

The genres of downward communication of the bureaucracy, are reproduced by the simplest uses of Lotus Notes and intranets. Typically these efforts include the classical “downward feed” of information, by the publishing of policy documents and textual representations of norms, regulations and operational instructions on the internal corporate Internet. Together with technical handbooks, newsletters,

address lists, etc., this seems to be the most common current use of intranets.

One example of the bureaucratic downward communication is the on-line versions of the organizational charts, and “reports-to” relations between people and departments that were put on the SAS Wide Web at SAS Institute, together with a vast amount of technical information (Bednarczyk & Bond, 1994).

Another example is the intranet at NSC, where it was proposed that the intranet should be organized to reflect NSC’s hierarchy, and force people go to through the correct channels to access the pages (Holland & Picard, 1995). Downward communication is the diffusion of “official” information to all employees.

Furthermore, the mainstream of workflow systems implemented in today’s organizations (e.g. Abbot & Sarin, 1994; Schäl, 1996) may be seen as a way of inscribing behavior according to the operational rules and norms, i.e. they enact and enforce the work manuals and operational instructions.

4.2.2 Upward reporting and coordination

Upward reporting is concerned with reporting information on which management is to base planning and decisions. This means collecting information from employees and middle managers. With more advanced intranet use, this can be done on-line, e.g., form based opinion surveys, status reporting etc. Workflow systems are increasingly being adapted to WWW-based architectures, making coordination and rationalization of work processes possible through the intranet.

Furthermore, the reporting functions are to a large part replaced by the workflow systems ability to automatically monitor data about resource consumption, project status, task performance etc.

4.2.3 Lateral genres

To go from instructions and manuals on the intranet, to share more vital knowledge and data, could for many managers be hard to bear, since much of the power and authority of middle managers stem from their role as information filters and mediators. For them strategically hoarding information may be more natural than sharing it. Taking the

control of information away, by sharing it with other employees on an intranet, will naturally entail conflict. The open sharing of vital information constitutes an important lateral type of genre.

A *lateral mode of communication* were formed with the diffusion of electronic mail and electronic conferencing in organizations. With the diffusion of Internet, employees (when the company allowed it) were served with an efficient channel for cross-divisional and even cross-company communication at an informal level. As reported by Sproull and Kiesler (1991) this was a powerful social force in many companies. Employees could for example compare their salaries, and other terms with people at other departments.

4.2.4 Volvo's Intranet

Consider the scenario reported in (Sprout & Coxeter, 1995):

“You’ve got two hours to put the finishing touches on your lunchtime presentation to the board of directors. You turn to your [...] web browser. Within minutes you’ve downloaded the bios of all the board members, to help tailor your pitch. Then you retrieve up-to-date sales numbers for every department in every office from Toledo to Tokyo.” (Sprout & Coxeter, 1995, p. 1)

This was almost what Volvo⁸ did, when they implemented an intranet in the organization. The intranet was originally, aimed at top management; wherever they were in the world they should be able to connect with a portable computer to the corporate intranet, checking email and fetch data from databases. In the beginning top management was skeptical; as top managers, they were not very skilled in new technology. The killer application, was when fresh Volvo data, sales numbers, etc. were put on the intranet, in the fashion of well designed overhead slides. Managers like overhead slides. Wherever in the world they are, they can now connect to the intranet, getting the latest figures for their presentation. The strategy of focusing on management was intentional. Besides, educating management in information technology, it had the effect that management realized the value, and that diffusion

⁸ This is based on initial material from a study at the Swedish car corporation Volvo.

spread to other levels of the organization. In one year, the intranet use increased from 50 to 5000 users.

The focus on top management, after a while drifted into a broader use: minutes from board meetings, telephone directories, internal magazines, environment scans, newspaper clippings about Volvo could be found on the internal web.

The next step will be to diversify, letting most information be available to every employee, but introducing information available only to some groups, e.g. management, a specific division etc.

4.3 Reflections on intranet genres

We can use the categories in Berkenkotter and Huckins (1995) framework for genre analysis to exemplify the sort of design oriented analysis, I want to arrive at, aiming at a more creative utilization of intranets.

4.3.1 Dynamism

As dynamic rhetorical forms, developed from actors' responses to recurrent situations, genres stabilize experience and gives it meaning and coherence. They change over time in response to their participants' needs, thus, they have to accommodate both stability and change.

4.3.2 Situatedness

Genre emerges out of praxis, in our participation in the communicative activities of daily and professional life. To be successful, the intranet functions, must fit the communication praxis, or provide a substantial benefit, as in the case with Volvo's intranet and the managers.

4.3.3 Form and content

An analysis of potential genres on the intranet will benefit from an understanding of what form and content is appropriate for the intended communicative purpose, in the particular situation, in the particular discourse community. The genre notions of the physical and

linguistic features of the communication, could function as a structuring of the analysis.

In several areas opportunities for dialogue are present on the intranet. Sometimes in the form of a speakers' corner, where employees can tell their opinion.

The most recent addition to Volvo's intranet, is the "CEO on-line", this is the home page of the CEO of the whole group of companies that comprise Volvo. Besides information as biography, recent speeches and the like, any employee can engage in a dialogue with the CEO, or any other of the chief executives. From a menu they choose among the managers, to whom they want to communicate. They can then choose to write their name, or to be anonymous, and if the dialogue should be private or public. If they choose public it will be published on the intranet.

4.3.4 Duality of structure

Giddens's (1984) concept of duality of structure relates genre to processes of structuration. When we engage in organizational or disciplinary genres, we constitute social structures and simultaneously reproduce these structures in professional, institutional and organizational contexts. Genre emerges out of practice and shapes at the same time that practice, structure is both medium and outcome for the reproduction of practices.

As one can see, from the mentioned examples, it seems that the most common uses of intranets, initially, reproduce existing practice. When the technology and its use reach a larger installed base, the new technology will instead shape practice.

4.3.5 Community ownership

Understanding genre is closely related to understanding the community "owning" it, their norms, ideology etc.

If the change of media, for a genre is aimed at a certain community, as the managers at Volvo, or at a broader community, such as all employees, will of course make a difference. Interesting here is to involve customers in the community, or to encourage customers to engage in forming their own community.

5. Conclusions

A study of the development and use of the intranet at Volvo has just begun. This study aims at analyzing the development of the intranet use, and the changes in both communication praxis and the evolution of the technology, by means of genre analysis. In this paper, I have argued that the framework of genre is a good starting point to understand, how such intranets may change practice, and vice versa.

Within such a framework we could invoke other theories of communication. We could use speech act theory to articulate routinized and procedural activities, but also to articulate the web of norms and regulations forming the institution. We could use *conversation* analysis to articulate interactive genres of communication.

By using the concept of genre and its characteristics, it is possible to study and discuss how certain genres could be enhanced with new technology and media, both in relation to working practice and opportunity for the business. It is also possible to experiment with future scenarios of what possible new genres that could emerge according to available media.

We could take as starting point any of the five characteristics of genre – dynamism, situatedness, form and content, duality of structure, community – each providing a different perspective of organizational communication.

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