THE STRUCTURE OF BUSINESS COMMUNICATION
THEORY, MODEL AND APPLICATION
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THEORY, MODEL AND APPLICATION

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For my parents Wim and Jopie
Colophon

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Preface

As human beings we are constantly surrounded and affected by all kinds of forms of communication, and at the same time we ourselves are an important source of communication for other people. This is such a normal phenomenon that we take it for granted. However, in the research that is presented in this dissertation, communication is not taken for granted, but it is considered with curiosity. The research describes the structure of communication in general, and the action coordinating function of communication in organizations in particular. This means that we have to open our eyes for the communication that surrounds us.

Although the dissertation deals with various aspects of communication, the "types" of communication that helped me to do and finish my research are not covered. The first type is supervising communication. With this type of communication Jan Dietz and Guy Widdershoven have guided me around the pitfalls of doing research. Their advice forced me to take the necessary decisions concerning the content as well as the progress of the research at the right moment in order to finish in time. Both aspects establish the core of supervising communication, I believe. Professional communication constitutes a sub-class of supervising communication and focuses on the content of the job to be performed. Henk Visser’s lectures and my discussions with him have proven to contain a high level of professional communication that has greatly broadened my understanding of the philosophy of language and the relation between theory and model in science. In this respect I also like to mention Heinz Klein. From my communication with him at SUNY I have got a better understanding of possible different interpretations of Habermas’ theory.

Colleagual communication is an important type of communication in doing research, because it sets the background conditions for the environment in which the research is to be performed. Most of the colleagual communication I had with my closest fellows in research. In the first place Ans Steuten en Nardo van der Rijst.
Most of the time they formed the direct sound board for my ideas and they allowed me to test my thoughts. In the second place the group of young researchers of the department of information systems. Hans, Roeland, Abraham, Stephan, Marielle and not to forget Leon made me feel comfortable after moving from the University of Limburg to Delft University of Technology. In the last place I like to thank Louise Chan for her constructive comments on the content as well as the language used in the dissertation.

The research would not have been possible without the информatory communication with the people in the field studies. In the first place I like to thank scheduling department of the faculty of Economics of the University of Limburg for allowing me to observe and record the activities involving the planning and scheduling of the educational activities, and in particular Frank Suelmann for his patience in making me understand the nature of the scheduling process. In the second place I like to thank the personnel of Alfabel for answering all my questions and in particular Sjraar Driessen for giving me carte blanche to do research in his company.

Supportive communication with friends and family sets the broader social environment in which a research is to be performed and completed. Without a sound social environment a research is doomed to fail. The discussions with Roel Otten and Toine Pieters on the mental problems in doing research have, more than once, motivated me to continue. From them I have learned a lot. In the finishing phase of the research, the enthusiasm of Marie-Josee Smits helped me to complete it. For the supportive part, I am greatly indebted to my parents and Barbera. In spite of the fact that it was hard for me to find the right words for explaining my research to them, they have always listened and they have always openly articulated their belief in my ability to successfully finish my research. The communication with them has been an invaluable support and I apologize for not being more clear.

Finally, I like express my deepest thanks to Liesbeth, because she has provided me with the best thinkable background conditions for doing and finishing my research.

Victor E. Van Reijswoud
Den Haag, May 1996
1

Introduction

The idea that communication between human participants is responsible for the coordination of action in an organization is getting increasingly accepted in informatics and organizational theory. In particular, the study of social organization has dedicated a lot of research to the analysis of communication in organization. Scholars like Luhmann (1985) and Bennett (1991) consider communication the essential, constituting or defining feature of all forms of social organization. Unfortunately, their focus is general, and they lack an analytical framework for studying how communication is organized. Major organizational theories emphasize the central role of communication (Galbraith, 1977; Mintzberg, 1989; Morgan, 1986), but they fail to provide an analytical framework for the understanding how communication constitutes organization. In the contemporary mainstream literature on organization, the concept of organizational communication remains a rather restrictive gloss for the means by which organizations establish and maintain their boundaries and integrity (Manning, 1992).

In the informatics area, the interest for communication is tightly coupled with the interest for information and information exchange. In the traditional informatical perspective communication is defined as a means for the exchange of information between intelligent agents (Davis, Olsen, 1984; Beek, Jager, 1993). By communicating, people aim at sharing information with each other for different purposes, and with different means. In conventional modeling techniques this idea of information sharing is conceptualized as data flows in an organization (see: e.g., Olle, et al., 1988). However, like the theory of organization, communication in the
field of informatics is considered at a general level. In other words, communication is described as a black box that has a certain input and a certain output, where the output is defined as the sharing of information between different people.

To achieve a better understanding of communication as a means to coordinate the actions of individuals, research should aim at opening up the black box of organizational communication. Only a full understanding of communication and its action coordinating nature provides a frame of reference for the area of informatics, and organizational theory (Taylor, 1993; Winograd, Flores, 1986). The research that is presented here pursues this line of thought. It develops a theoretical framework and a model for the understanding of the structure of communication as a process that constitutes and coordinates action in an organization. This means that it will draw from, and elaborate on theories of social organization, communication, and informatics. Firstly, the research establishes a theoretical understanding of communication as a means to coordinate activities in general, and in organizations in particular. Secondly, it extends the theoretical understanding with an empirical justification by means of analyzing action coordinating communication in actual business situations and the examination of the implications of the application of this understanding in two areas of informatics.

Before the theory of communication and its action coordinating nature is presented in chapter 2, the current chapter is used to establish a background for understanding. Section 1.1 elaborates on two perspectives from which organizations can be analyzed. These two perspectives constitute the rationality concepts that can be applied to organizational communication. The section concludes with a positioning of the research in these two perspectives. Section 1.2 presents the central research questions and the objectives of the research. Section 1.3 elaborates on the research methodology that has been applied to investigate the structure of organizational communication, and concludes with a description of the methodology that is used. The chapter is concluded with the explanation of the outline of the dissertation.

1.1 Researching organizations from an informatical perspective

The introduction of this chapter states that there is an increasing awareness that communication forms the backbone of organizations; that it forms the means by which organizations are organized. This point of view is confirmed by various researchers (E.g., Winograd, Flores, 1986; Medina-Mora, et al., 1992; Dietz, 1993; Manning, 1993; Taylor, 1993; Meijers, 1994). This means that when the structure of communication is to be determined, there needs to be a clear understanding of the nature of organizations, communication, and their interdependency.

When researching the nature of organizations, it is of extreme importance to have a clear understanding of the perspective from which an observer observes. Klein and Hirschheim (1991) name this the rationality concept that guides the perceptions and the applied problem solving process of the observer. In Sol et al. (1992) the rationality concept used in a research is part of the way of thinking, while Checkland (1981) speaks about the world view or ‘Weltanschauung’. In the current
section, I explore two rationality concepts that are in use in the informatics area for the examination of organizations. This examination forms the basis for the description of the way in which organizational communication has been analyzed in the current research.

1.1.1 Hirschheim’s two office perspectives

According to Hirschheim (1985a) there are two different theoretical perspectives: **analytical** and **interpretivist**. Although Hirschheim only relates these two perspectives to offices, there is no indication to suggest that these perspectives should not be expanded to organizations as a whole. The analytical perspective views organizations as an environment where people perform a variety of functions to support the successful running of this organization. The functions are conceived in terms of largely formal and structured actions or activities. The analytical perspective can be characterized as being task-oriented. The interpretivist perspective perceives organization in terms of being mostly unstructured and informal human action. The interpretivist perspective is socially oriented, i.e., looking at organizations within the context of behavioral and social interaction. The research traditions in both perspectives and their constituting views are examined in more detail below.

1.1.1.1 Analytical perspective

Hirschheim (1985a) summarizes the characteristics of the analytical perspective on organizations as follows:

- the organizational functions are perceived as being largely deterministic, rational and overt;
- the organization is perceived metaphorically as ‘structure’;
- organizational action is considered in terms of manifest behavior;
- formal models using empirical methods are considered as the appropriate measurement instrument;
- the research paradigm is characterized by quantitative research;
- the focus of the research is on analysis of operations and functions by breaking them down into constituent parts.

The analytical perspective is reflected in three different views on organization: organizational activities, organizational semantics, and organizational functions. The **organizational activities** view is by far the most prevalent view in the analytical perspective. It perceived an organization as being composed of a variety of activities that support the successful operation of the organization as a whole, a philosophy that finds its roots in the work of Frederic W. Taylor (1911). The view has provided an important contribution to the specification of organizational tasks that can be supported by technology (see: e.g., Morgenbrod, Schaertzel, 1980). However, a major shortcoming of this view is that it does not attempt to understand the underlying rationale regarding why activities are performed.

The **organizational semantics** view focuses its attention on the behavior as a reflection of the organizational goals. Barber (1983) defines this view as the study of
information intensive work that reflects the concern with the intention behind the act. It is an expansion of the work done on data semantics by the data base community, and borrows heavily from artificial intelligence thought. The primary focus of this view is to develop an understanding of not only how an individual performs a certain task, but also the reasons why the task is performed. Therefore the approach relies on procedures and goals; i.e., problem solving is characterized as a search for a procedure which will achieve some desired goal, where goals provide the mechanism for understanding organizational behavior. The research as presented by Bots (1989) provides a good, recent, example of this view. The organizational semantics view offers an interesting alternative to the activities view. The problem with this view is that it regards organizational goals as unproblematic and unambiguous concepts. However, writings in organizations and power (see: e.g., Mastenbroek, 1992; Forster, 1989; Mumby 1988; Wrong, 1979) show convincingly that organizational goals are strongly influenced by politics and power, and therefore it is impossible to unambiguously elicit and formulate organizational goals.

The third view, called the organizational functions view, places primacy on the functions that occur in an organization. The functions are analyzed through the analysis of procedures. Functions are interrelated and aggregated into higher level functions and larger subsystems, in such a way that they instrumentally achieve some organizational goal. Functions are structures by prescribing the tasks, roles, behavioral expectations, duties, and responsibilities that are associated with each organizational function. Therewith, the functions view abstracts from the individuals, and shifts the focus to roles in the organization. An important danger of this view is that it tends to forget capriciousness of human behavior.

These three views in the analytical perspective are respectively similar that they focus on the manifest behavior as the key element or primitive, but at the same time this is in effect the most important difference with the interpretivist perspective that concentrates on the examination of the motives behind the manifest behavior (Hirschheim, 1985a).

1.1.1.2 Interpretivist perspective

The interpretivist perspective is characterized by Hirschheim (1985a) as follows:
- the organizational functions are perceived as being largely non-deterministic, political and overt;
- the organization is perceived metaphorically as ‘agent’ or ‘culture’;
- organizational action is seen in terms of the shared social meaning of the participants;
- phenomenological study is considered to be the appropriate measurement instrument;
- the qualitative research paradigm is dominant;
- the focus is on understanding of social actions and meanings of the participants in a social setting.
The interpretivist perspective is applied in four views on organizations: work roles, decision taking, transactional, and language action. The work roles view perceives an organization in terms of the series of work functions which are performed by its members. The aim of the roles view is to elicit the motives behind the execution of the actions within an organization. The research of Mintzberg (1973) in which he examined the work of managers is a good example of this line of research. Mintzberg divided managerial work into 10 roles categorized in three groups (interpersonal, informational, and decisional). This approach has been extended in more detail by Andersen (1991) and Holmqvist, Andersen (1987), and applied to information systems design (Andersen, Holmqvist, 1991). Whilst the work roles view provides more and different insights into the nature of organizational work, as compared to the research in the analytical perspective, there has also been criticisms regarding this approach. Suchman (1987; 1994) has shown that it is not only very difficult to reduce the richness of organizational work to simplistic categories, but a reduction of this kind may also result in the repression of the workers in an organization.

The decision taking view sees organizations in terms of decisions which have to be taken by various decision makers. The central issue here is decision-taking, this includes, what decisions are made, by whom, for what reasons, the decision maker's cognitive style, etc. There are two complementary components of this view: 'cognitive style' and 'decision-making models'. The former reflects the particular cognitive preferences of the individual decision maker, by examining the cognitive processes involved in problem solving and the use of available information. This approach has resulted in several cognitive style typologies (see: e.g., Churchman, 1971; Mason, Mitroff, 1973). Decision-making models focus on models adopted by decision makers and their corresponding decision making behavior. It addresses conceptual ways people make decisions. Simon's work on decision making is a classic example of this view (March, Simon, 1958; Simon, 1960). More recent examples of decision making models can be found in (Checkland, 1981; Davis, Olsen, 1984; Mintzberg, 1983; 1989).

The transactional view perceived organizations as arenas of information exchanges which operate on the basis of contracts. Organizations are viewed as stable networks of transactions which are regulated through processes of coordination and control, by a set of contracts. The workers are viewed as information exchangers who behave opportunistically whilst bargaining amongst themselves for information. The focus in the transactional view is thus on information exchange. The transactional view is mainly founded in the Transaction Cost Theory of Williamson (1975; 1979; 1986), and has been extended to the field of informatics by Ouchi (1980).

Finally, the language action view looks at organizations in terms of social action mediated through communication. The focus of this last view is on language actions as a means to understand organization. The physical attributes of a given human activity and the rules of the human interaction are framed as linguistic phenomena. Lytinen (1985) postulated four assumptions that underlie the language action view:
natural language sentences correspond to the performance of social acts; these are the speech acts;
the speech act is the basic unit of linguistic communication;
the meaning of sentences for the actors in a social setting is revealed by describing the kinds of acts that have been performed through their utterance;
speech acts obey socially determined rules. Since these rules govern the performance of speech acts, they permit the systematic study of meaning, and more generally, linguistic behavior.

The analysis of organizations is performed on the basis of the communication that is used by the workers in an organization. The communication may be analyzed in detail at four different levels: form (syntaxis), content (proposition), intention (illocution), and effect (perlocution). Since the language action view analyzes organizations at multi-levels, it is able to present a rich picture of an organization. However, the focus is on the persons as hearers and receivers of messages, and this limits an abstraction from persons to functions or roles.

The interpretivist perspective aims at achieving an understanding of phenomena, irrespective of the nature of the phenomena. The next section relate the interpretivist and analytical perspectives to organizational communication.

1.1.2 Researching organizational communication

When Hirschheim's two perspectives are used to narrow down communication in organizations, a differentiated picture of organizational communication appears. The application of the analytical perspective to organizational communication results in a detailed description of the different communication tasks that are performed by the workers of an organization. An organizational activities view on organizational communication will result in the subdivision of the entire communication activity in an organization into smaller, constituting, communication activities on the basis of criteria like; person, goal, department, etc.. The organizational semantics view investigates what different communication activities are needed to perform a specified organizational task. In effect this means that it makes an inventory of the different inter-relationships between communication activities in the organization. Researching organizational communication from an organizational functions view results in a description of the functions of communication in relation to the central process in the organization. In other words, an organizational map is created on the basis of the functions of communication in the organization.

If organizational communication is examined from an interpretivist perspective, a more detailed understanding is gained of the individual communication processes in an organization. A role view of organizational communication would result in a categorization of different types of communication with specific characteristics, while the decision-taking view results in an account of the decision moments in communication processes as well as the role of communication in decision-taking moments in organizations. When organizational communication is examined from a transactional point of view, the bargaining characteristics of communication, as an
interplay between the human and its (human or non-human) environment, will be brought to the forefront. A transactional view will highlight the complexity of organizations as negotiated social constructs. Finally, the language action view on organizational communication aims at developing a detailed understanding of the syntactic, propositional, illocutionary, and perlocutionary elements in the communication that is used by the organizational members.

Although Hirschheim seems to describe the analytical and interpretivist perspectives as incommensurable perspectives, it can be argued that the two perspectives need to be considered as being complementary to each other when researching communication in organizations. Within the interpretivist perspective the main focus is on a detailed understanding of individual units\(^1\) in the domain of organizational communication. However, the relationships between the units are not investigated. Within the analytical perspective the opposite is observed; the focus is on the understanding of the relationship between the different units in organizational communication, while a detailed comprehension of the constituting units is considered to be beyond the analytical scope. In the current research the analytical and interpretivist perspective are considered to be complementary to each other. In the first instance a detailed understanding of communication is achieved from a interpretivist perspective. The focus is on the determination of the nature of individual organizational communication processes. In the second instance, an analytical, organizational functions perspective is chosen to relate the detailed understanding of individual communication processes to their functions in organizations.

Since the interpretivist language action view starts from the assumption that organizations need to be understood in terms of social action mediated through communication, this view is most appropriate for understanding the action coordinating nature of communication in organizations. This hypothesis is confirmed by Taylor (1993) who applied Speech Act theory as proposed in (Austin, 1962; Searle, 1969; 1979) as a foundation for the understanding of organizations. The transactional view provides is expected to provide a more significant value to the language action view because it provides the research with an understanding of negotiations in organizational communication. Together the language action view and the transactional view on the functioning of organization are expected to provide an in-depth understanding of the way in which the workers of an organization use communication to coordinate their activities.

### 1.2 Research objectives

Since the introduction of the language action view in the area of information systems by Flores and Ludlow (1980), it has grown to a mature line of research. Although most of the current research is concentrated in the area of computer supported cooperative work (CSCW) as a means to understand coordination and

---

\(^1\) At this point in time I will not elaborate on the possible units in communication. At this moment one can think of sentences. The possible units are examined in detail in chapter 2.
group decision in organizations, recently, the language action view is also receiving more and more recognition in organizational modeling for the purpose of information system design (Johannesson, 1995; Dignum, Weigand, 1995; Dietz, 1993), analyst-user communication (Tan, 1993; Janson, Woo, 1992), workflow management (Schäl, 1995; Schäl, Zeller, 1993), business process redesign/reengineering (Dietz, 1994a; 1994b; Reijswoud, Rijst, 1995a), and the design of computer mediated communication systems (Agostini, et al., 1994; Flores, et al., 1988).

The theoretical foundations for the language action view, as proposed by Flores and Ludlow and developed in greater detail by Winograd and Flores (1986), have remained relatively stable over the years. The core of the theoretical foundation of the language action view is formed by the Speech Act theory (Austin, 1962; Searle, 1969; 1979). On the basis of this philosophy, organizational communication is conceptualized as the exchange of speech acts for the purpose of coordinating organizational activities (Flores, Ludlow, 1980). Since there has been criticisms on the Speech Act theory from theoreticians in the area of the philosophy of language and social organization (E.g., Vendler, 1967; Holdcroft, 1978; Wunderlich, 1980; Habermas, 1981; Lepore, Van Gulick, 1991), there is ground to evaluate the accuracy of the theoretical foundations of the language action view. This evaluation is even more justifiable because one of the most important critiques states that Speech Act theory is not able to explain what really brings about communication mediated coordination of action (Habermas, 1988; Dietz, Widdershoven, 1991), while most important claim of the language action view is that it provides this understanding. In the light of these critiques a critical evaluation of the Speech Act theory, and its explanatory power as a framework for the understanding of communication in organizations is justified. In the line of this critical evaluation, implications for informatical approaches relying on the Speech Act theory have to be established. These observations have lead to the central question of the research:

What is the structure of the communication that is used between the workers of an organization to coordinate their activities, how can this structure be modeled, and what are possible implication for the field of informatics?

The research has five objectives. Together, the set of the five objectives provide the answer to the central question of the research. The research aims to:

1. formulate a theory of the structure of communication that explains linguistic coordination of action in general and in particular within organizations;
2. construct a model of action coordinating communication in organizations;
3. understand and model action coordinating communication in organizations;
4. apply the model of action coordinating communication for the analysis and optimization of organizational communication;
5. apply the model of action coordinating communication for the determination of functional design requirements of computer mediated communication systems.
Both the theory and the model that are developed in the research are not limited to a particular type of organization. They focuses, however, only on the communication that is used between humans.

In the next section I will elaborate on the research approach that has been followed to answer the central research question.

1.3 Research methodology

The steps taken to develop an understanding of action coordinating communication in organizations can be structured by many research methodologies. Each of these methodologies has its own characteristics and requires a particular design and manner of data collection. The purpose of this section is to describe the research methodology that has been adapted in this research.

The research methodology that has been followed in the present research is determined by the research objectives. On the basis of these objectives, the research path has been divided into three distinct, but inter-related constituent parts: theory and model building, empirical testing, and application. Section 1.3.1 elaborates on the theoretical points of view that have been chosen. Section 1.3.2 explains in detail the methods that have been used to examine the relation between the theoretical model of communication and the communication that is observed in businesses. This section justifies in much detail the research design that was chosen. Finally, section 1.3.3 explores two possible application areas for the insights gained in the previous two parts of the research.

1.3.1 The theory and model construction

The first step in the research has been the critical exploration of the current literature on language, communication processes, and coordination of action in the social world. The purpose of this examination is to establish a theoretical understanding of communication mediated coordination of action. It is argued that coordination of action by means of communication can only be understood if language, communication processes, and coordination of action are considered in conjunction with each other. Language, as a means for communication, is considered from three different perspectives. It is shown that each of these perspectives highlights different aspects of language. By means of a leading example, that is used throughout the theoretical part, it is shown that a thorough understanding of the structure of language is not sufficient to understand linguistic coordination of action in organizations. Therefore, the communication processes, in which natural language is used as a means for information transfer, is examined in detail. This examination results in a cyclic communication process model that explains how the exchange of language signs between human actors is structured. However, it does not provide an explanation for linguistic coordination of action. This aspect of communication is explained on the basis of insights in the literature on social organization.
After an understanding is achieved about communication in general, the research is narrowed down to organizational communication. The literature on organizations and business communication is examined in order to ascertain specific characteristics of organizational communication. In this part of the research it can be observed how the interpretivist perspective on communication can benefit from results obtained by analytical research.

On the basis of the characteristics of organizational communication and the theoretical understanding of the structure communication and its action coordination characteristic, a model of business communication is developed. This, so-called, Transaction Process Model is constructed with behavior modeling tools that are used in modeling approaches in the analytical perspective.

1.3.2 Modeling business communication

The second part of the research concerns the illustration of the usage of the theoretically determined Transaction Process Model representing communication in organizations with the aim to obtain empirical evidence for the completeness of the model. It is defined that the model is complete when the communication that is used between the workers in an organizational can be fully represented and explained with the usage of this model.

The theoretically determined Transaction Process Model is applied to the business communication obtained by means of two field studies. The first study was conducted in the first half of 1993 at one of the scheduling offices of the University of Limburg in Maastricht, while the second study was conducted at a medium size company, whose main product was high quality aluminum window frames. This study was conducted in the first half of 1994. Organizational communication in both studies was approached from both an analytical and an interpretivist perspective with emphasis on the transactional structure and the language action structure of the communication.

The analytical analysis of organizational communication in both field studies is performed with the Dynamic Essential Modeling of Organizations (DEMO) approach. This modeling approach provides a way to model the dynamics of an organization as a system of actors carrying through transactional communication. The analysis with DEMO provides the basis for a further, interpretivist analysis of organizational communication.

The interpretivist analysis of organizational communication was performed with the Transaction Process Model. A formula underlying this approach is able to represent the structure of individual utterances, while the model itself is used to represent the communication structure of business communication.

Before continuing to the introduction of the application areas in section 1.3.3, this section is concluded with a detailed justification of the research design and the methods for data collection that were applied for the examination of business communication by means of two empirical studies. This section describes the field study research approach for researching organizational communication.
1.3.2.1 Field study research

In a manner of speaking, there are four possible types of research designs: true experiments, quasi experiments, natural experiments, and naturalistic experiments. This division is proposed by Bernard (1994) to structure anthropological research. These four research designs are divided into two main groups. True and quasi experiments are conducted and the results evaluated later, while natural and naturalistic experiments, by contrast, are going on around us all the time. They are not conducted by the researchers, they are only evaluated.

True experiments can be conducted in the controlled conditions of a laboratory or under controlled conditions in the field. True experimental research designs exhibit the following archetypal steps:

1. the selection of at least two groups, a treatment group and a control group. One group gets the intervention and the other does not;
2. assigning the individuals randomly to either the treatment group or the control group, to ensure that the groups are equal;
3. pretest: the measuring of one or more dependent variables;
4. the introduction of the intervention (the independent variable);
5. post-test: the dependent variables are measured again.

The most important difference between true experiments and quasi experiments is that in quasi experiments the participants are not randomly assigned to the treatment and control groups. The difference between natural and naturalistic experiments is that naturalistic experiments are contrived so that more or less structured data can be collected for evaluation. Table 1.1 summarizes the differences between the four anthropological experiments.

The purpose of the current research is to examine the action coordinating nature of organizational communication. This implies that the research does not aim at reporting on the effects and results of an intervention. On the contrary, the research focuses on the understanding of a phenomenon that forms an integral part of an organization. Further more, the research aims at the portrayal of an ongoing phenomenon. Intervention that leads to (fundamental) changes in organizational communication needs to be avoided. On the basis of these characteristics of the research and the research object, natural experiments is decided to be the most appropriate research design.

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Table 1.1 Experiments in anthropological research
A frequently used research design in interpretivist research is a case study research approach. There are two distinct types of case study research: inductive, and deductive case study research. The most important difference between inductive and deductive case study research is the fact that inductive case research uses the research data to formulate hypotheses, while deductive case study research formulates the hypotheses on the basis of an extensive survey of relevant literature, and uses the research to test these hypotheses. This distinction makes the first type more suitable for relatively unknown phenomena, and the second type more suitable for in-depth study of known phenomena. The case study approach for the generation of hypotheses has been described extensively in (Glaser, Strauss, 1967; Glaser, 1987; Eisenhardt, 1989). Examples of case study research for the purpose of testing hypotheses can be found in Yin (1984). A special type of case study research is described in the action science research program (Argyris, 1980; Argyris, et al., 1985). This type of research combines inductive and deductive research design with controlled intervention. Because the current research is not aiming at intervening in the organizational communication patterns, this line of research is not considered in detail.

The principles of inductive and deductive design of case study research can also be applied to natural experiments. Inductive natural experiments focuses on the formulation of research questions on the basis of research data, while deductive natural experiments formulate research questions and uses empirical research data to test them. The current research develops a theory and a model of communication in the first place, and includes empirical data in the second place. Therefore the research is characterized as having a deductive nature.

Both case study research and anthropological experiments have many different methods for data collection at their disposal. Roughly, these methods can be divided into quantitative and qualitative methods of research. Quantitative research investigates the extent to which a certain phenomenon occurs, while qualitative research methods focus on the determination of the nature of certain phenomena (Looff, Berghout, 1994). Since the aim of the research is to determine the nature of organizational communication, the research is characterized as being qualitative. The methods that are used in the research fall in the following general categories:

- questionnaires;
- analysis of ‘texts’;
- interviews;
- observations.

Questionnaires form an important method for data collection in both qualitative and quantitative research (Bernard, 1994). There are all sorts of questionnaires. The questions in the questionnaires may be forced-choice (also called "closed") or open-ended, and in all possible mixes. The major advantage of closed-ended questions is that they allow quick quantitative analysis. Open-ended questionnaires are more difficult to analyze and therefore they are generally used for additional information or as in depth information. In this research mainly open-ended questionnaires were used.
The analysis of texts as a method of research stands for a lot of different methodological approaches. One of them is content analysis which is considered to be a blend of qualitative and quantitative research (Bernard, 1994). By using content dictionaries, the researcher can produce research data that can be subjected to quantitative research methods. Text analysis is also an important method in linguistics (Droste, 1985) and conversation analysis (Nofsinger, 1991; Levinson, 1983; Taylor, 1993). The aim of text analysis in linguistics is the uncovering of the sentences constituting a text. In conversation analysis, text analysis is applied to transcribed conversations for the purpose of uncovering the relationships between the sentences constituting a conversation. In the current research both linguistic and conversation oriented text analysis have been applied.

Interviewing is probably the most widely used method of data collection, but is mostly used in combination with one of the other methods for data collection. There is a continuum of interview types based on the amount of control over the responses of the informants. On the one end of the continuum informal interviewing is located, and at the other end structured interviewing. Unstructured and semi-structured interviewing is located in between. Informal interviewing is characterized by a total lack of structure or control. The informant is not aware of the fact that he is being interviewed. Unstructured interviews are based on a clear plan, but are also characterized by a minimum of control over the informant’s responses. These interviews are mostly used in situations where the interviewer can interview the people on multiple occasions. Semi-structured interviewing is often used when the interviewer will not get the chance to interview the informant more than once or twice, and a list of questions is used by the interviewer to maximize the benefit of the interview. Finally, structured interviewing is used in interviews in which multiple informants are asked to respond to as nearly identical set stimuli as possible. In investigating organizational communication, unstructured and semi-structured interviewing techniques were applied primarily. Semi-structured interviews were only used to get an initial understanding of the research site, while structured interviews were not used in the research.

Like interviewing, observation as a way of data collection is normally used in conjunction with other methods (Bernard, 1994). Participant observation (also called unobtrusive observation) is a well developed method of data collection in natural and naturalistic experiments, at the same time, however, there is a lot of controversy about the actual way of doing this. The essence of the method is that the researcher wants to observe the actions of the others while disturbing these actions as little as possible, because of unwanted ‘observer effects’. The controversy concentrates on the optimum position on the scale from ‘complete participation’ to ‘complete observation’ (Collins, 1984). Collins opposes unobtrusive observation with participant comprehension. In participant comprehension, the researcher does not seek to minimize interaction with the people under study, but aims at maximizing it. The researcher should come to be able to act in the same way as the native members ‘as a matter of course’ rather than remember or record the details of their interactions. Once the way of life in the field under study is internalized (achieving ‘native competence’), the observational benefits can be maximized. The
participant comprehension is seldom used in anthropological studies, but is frequently used in modern science research (Collins, 1985; 1990).

For the purpose of the deductive natural examination of the action coordinating nature of organizational communication, questionnaires, text analysis, and interviewing have been embedded in observations of a participant comprehensive nature. In order to distinguish the deviant nature of this research method from the commonly used methods in natural experiments and case studies, I prefer to call the chosen research approach field study research.

An important and much debated issue in science is the replicability of research and the generalizability of its results. In the literature on research methods, true experiments are considered to exhibit a high level of replicability and generalizability, while natural experiments are difficult to replicate and their results difficult to generalize (Bernard, 1994; Swanborn 1987). This presupposition is founded in the fact that true experiments are conducted under controlled (laboratory) circumstances, while natural experiments aim at minimizing their interference in the research environment, and therefore they are unable to control the research environment. Swanborn hypothesizes this may also be interpreted as natural experiments being more generalizable than true experiments (Swanborn, 1987). This point is elaborated in detail in (Argyris, et al., 1985). Collins (1985; 1984) shows convincingly that scientific research in general (experiments as well as case study research) and its resulting knowledge suffer from problems with replicability and generalizability. He considers these problems inherent to scientific research and locates the origins of these problems in cultural differences between (groups of) scientists. Since the literature is not unambiguous about the replicability and generalizability of either method in research, the position taken in this research is one of reservation. Replication of the research is possible only when a similar research approach (achieving native competence) is followed. The results of the research are expected to be generalizable to organizations similar to the organizations that were investigated in the research. The generalizability of the theory of communication and the model of business communication can, however, only be guaranteed when it has proven to be appropriate in a large number of studies.

1.3.3 Application of the model

The third part of the research explores two possible application areas for the theory of communication and the Transaction Process Model. It is hypothesized that both the optimization of business communication processes and the design of computer mediated communication systems (CMCS) may potentially benefit from an improved understanding of action coordinated communication in organizations. These two application areas are selected because they are both strongly related to the communication that goes on in an organization.

The methods that are used in this part of the research are of the same kind as the methods used for the analysis of business communication in the two field studies. The optimization of the business communication is performed with diagrams that
are drawn on the basis of the Transaction Process Model. The organizational models that are produced by the DEMO approach form an important starting point for the optimization. In the case of the design of computer mediated communication systems, I use the information modeling method as used in the DEMO approach and Task Analysis Technique to present a functional design of a CMCS called COMMUNIST. The information modeling technique is used to describe the objects of the system and the Task Analysis Technique to describe the behavior of the system.

1.4 Structure of the dissertation

The dissertation is divided into two main parts: Theory and Practice.

The first part, *Theory*, is formed by chapters 2 and 3, and describes the theoretical path that has been followed in the research. Chapter 2 describes the structure of communication in general. It examines and uses insights from linguistics, semiotics, philosophy of language, communication process theory, and critical social theory. Together these theories provide the basis for the understanding of communication and its action coordinating nature. Chapter 3 narrows the focus down to communication in organizations. It elaborates on insights from organizational communication theory and informatic theories of business communication. In the final section of chapter 3 the theoretical work of both chapters 2 and 3 is put together in the Transaction Process Model, a model that provides the understanding of the structure of action coordinating communication in organizations.

The second part, called *Practice*, is formed by chapters 4 to 7, and describes the practical application of the Transaction Process Model. Chapter 4 starts with an examination of the modeling tools that are used in the DEMO approach, because these tools are used in the analysis of the field studies. The chapter then continues with the actual analysis of the first field study, the analysis of a scheduling department of the University of Limburg. Chapter 5 presents the organizational analysis of a medium size production company. Both field studies have been modeled first with the organizational modeling method DEMO, and then the results of this analysis are extended with the communication analysis with the Transaction Process Model. Chapters 6 and 7 describe two possible application areas of the Transaction Process Model. Firstly, in chapter 6, the possibilities of the Transaction Process Model for the optimization of business communication is explored. It is hypothesized that the model provides a valuable means to diagnose and to optimize communication processes in organizations. Secondly, chapter 7 explores the design of computer mediated communication systems founded in the Transaction Process Model. An initial examination of the literature on computer mediated communication shows that very few system designs are founded in a theory of communication. This is remarkable, since the systems are supposed to support communication. The remaining part of the chapter is used to illustrate what a design of a computer mediated communication system will look like when it is founded in the theory of communication and the Transaction Process Model.

In the epilogue, chapter 8, the main results of the research are summarized and an agenda for future research is proposed.
PART I
THEORY
Communication is a complex phenomenon that can be considered from different perspectives and at different levels. In the area of informatics, communication is traditionally seen as the means to exchange information for the purpose of coordination (e.g., Davis, Olsen, 1984; Olle, et al., 1988; Beek, Jager, 1993; Vreede, 1995). In this view human beings are conceptualized as information processors. Research that is founded in semiotics (e.g., Stamper, 1973; 1993; Liu; 1993), the philosophy of language (e.g., Dietz, 1993; Dietz, Widdershoven, 1991; Auranäki, et al., 1988; Winograd, Flores, 1986; Flores, Ludlow, 1980) proposes a more complex characterization of communication. It is this line that will be followed in the chapter.

The aim of this chapter is to develop a theory for the understanding of the structure of communication. This theory builds on three elements: language, communication processes and coordination. This three-level theory provides a firm basis for the understanding of action coordinating communication in organizations. Therefore the current chapter has to be considered as the prologue for the next chapter in which a model representing the structure of business communication will be developed.

The current chapter presents a detailed examination of the three elements underlying communication. In section 2.1 the structure of language, considered as the means by which communication takes place, is considered from three perspectives. These perspectives are: the representational, the functional, and the action perspective. Each of these perspectives views a specific aspect of language.
The representational perspective considers the underlying structure of well-formed sentences, the functional perspective focuses on the function of an expression, and the action perspective considers the effects of the utterance of a language construct. In section 2.2 the exchange of language signs between human beings is examined in more detail. A traditional communication process model is examined and a new model is proposed. Section 2.3 introduces the semiotic framework as an onset for the understanding of linguistic coordination of action in section 2.4. Section 2.5 is used to summarize the theory of communication.

2.1 Language

Language has many different appearances. The best known distinction divides language in terms of verbal and nonverbal language. Verbal language consists of oral and written messages, while nonverbal language includes the remaining forms of communication, like gestures, moods, pictures, art and music (Robbins, 1993). The study of nonverbal language and its structure is surrounded by scientific ambiguity (Ducrot, Todorov, 1979). In the present examination I have chosen to focus only on verbal language.

Verbal language is a sign by which humans communicate (Stamper, 1973). The notion of signs is elaborated on in detail in the areas of semiotics and semiology. Semiotics tends to relate more to the logical aspects of signs and semiology tends to relate more to the role of signs in society (Stamper, 1993). Traditionally, the divisions of semiotics have been syntaxics, semantics, and pragmatics. This division is postulated by Morris (1938) and further developed by Carnap (1942). Each of which deal, respectively with the structures, meanings and usage of signs, reflecting the philosophical roots of the subject.

Although the distinction between syntaxics, semantics and pragmatics is often used in linguistics (e.g., Levinson, 1983; Dik, Kooij, 1979), the philosophy of language (Harrison, 1979; Nuchelmans, 1978), and informatics (e.g., Stamper, 1993; Liu, 1993; Dietz, 1992), an alternative terminology will be adopted. The most important reason for the rejection of the distinction is the fact that the literature proposes many, more or less, different interpretations of notions syntaxics, semantics and pragmatics. Because I do not want to get entangled in these definitions, I introduce three different perspectives: the representational perspective, the functional perspective, and the action perspective. The names of these perspectives reflect the dominant interpretations of the structure of language. The representational perspective is the best known perspective for the analysis of the structure of language. It focuses on the determination of the form and the meaning of language signs. The functional perspective expands on the representational perspective, by also considering the function of a language sign in human social interaction (Siewierska, 1991). The action perspective considers the social effects of the uttering of language signs.

\[1\] Levinson (1983, pp. 1-5) provides an illustrative overview of the different interpretations of the notion of pragmatics that can be found in the literature.
In the following three paragraphs focus on a examination of the uncovering of form and meaning in the representational perspective, form and function in the functional perspective, and form and effect in the action perspective. Next to the theoretical underpinnings of these three perspectives, the possibilities and limitations of perspectives are illustrated with the application of some methods in these perspective to a leading example.

2.1.1 The representational perspective

Since the late nineteenth century the perspective on the structure of language that has attracted a lot of attention focuses on the representational character of language signs. It is only since the last two decades that this attention has slowly shifted away to the perspectives where function and the effects of language usage receive more attention.

The study of the representational character of language signs concentrates on form and meaning, and excludes the function and the effects of language. The starting point of the representational perspective is that language signs are composite structures, that can be decomposed in its constituents. Each of the constituents has at least one meaning, and when expressed in a composite, the combined constituents express a new meaning. In order to achieve a specific meaning, a specific type of form has to be chosen. This form is subjected to rules.

The representational character of language is studied apart from the person and context in which the sign appears. The unit of analysis, or the linguistic construct, that is considered in the representational perspective is the sentence. This refers to expressions starting with a capital letter and finishing with a full stop. Between these two markers there must be at least one word.

The methods that are used to study the representational character of language signs are divided in two main categories: logic oriented methods and linguistic theory oriented methods (Chomsky, 1954). The aim of logical approaches to language is the exploration of the possibility to represent and reason about expressions in these languages by means of the introduction and usage of formal languages. In recent years, many different formal languages for specific types of reasoning have been introduced. This means that there are logic oriented approaches for syntactic, semantic (for an overview see: Gamut, 1982), and pragmatic analysis of language (Searle, Vanderveken, 1985; Vanderveken, 1990). Related to these logical approaches, formal grammars like the Montague Grammar have been proposed. This grammar aims at constituting a formal calculus that makes it possible to determine the logical value (truth conditions) of a language sign on the basis of the words of which it is composed. This research is based on the principle, formulated by Frege, according to which a compound sentence ought to be function of its constituents (Gamut, 1982; Van Eynde, 1985).

The linguistic oriented approaches to the representational character of language signs are best explained with Saussure's distinction between langue and parole, and syntagmatic relationships and paradigmatic relationships. Saussure states that language, at every moment of its existence, must present itself as an organization.
He labels the organization, that is inherent in every language, a system. If one considers language as a particular kind of human behavior, one speaks about 'parole'. If one, on the other hand, considers the structure of language signs, one focuses on the 'langue'-aspect of language. The representational perspective concentrates on langue. Within the realm of langue, syntagmatic relationships describe the relationships between the combined elements of one single sentence or utterance. Paradigmatic relationships are not limited to one single sentence or utterance, but describe relationships of elements that have particular systematic similarities. In other words, syntagmatic relationships concern the possible ways, at any level, in which the elements of a language can be combined, while paradigmatic relationships concern the identification of classes and categories of elements in a language on the basis of their mutual similarities. In the representational perspective more emphasis is placed on the identification of paradigmatic entities in linguistic sign than on the determination of syntagmatic relationships.

The foundations of the methods in the linguistic branch of the representational perspective are established by the structuralistic approaches to language of De Saussure and Bloomfield. In the beginning of this century both scholars focused on the deconstruction of language into segments. Saussurian and Bloomfieldian structuralism stayed dominant within the representational perspective until Chomsky introduced his transformational-generative grammar (Chomsky, 1957, 1965) in the 1950's.

The foundation for Chomsky's transformational-generative grammar is formed by the conception that language is considered to be a finite system of basic elements and rules, that enables the creation of an infinite number of possible and permitted (grammatical) linguistic constructs. In Chomsky's work a distinction similar to Saussure's distinction between langue and parole is observed. The knowledge of the structure of a language is called competence, which is similar to langue, and the actual use of this structure is called performance, which is similar to parole. Chomsky's theory only focuses on competence. According to Chomsky, the generative grammar of a particular language comprises a set of rules which mechanical application produces the acceptable (that is, grammatical) utterances of that language, and those utterances alone. The generative component he called the syntax. Each rule describes a certain operation that may be performed on any string of symbols. Sentences are decomposed in larger and smaller segments (strings of symbols), or in Saussure's terminology called paradigmatic units.

Chomsky's theory provides a systematic method for the determination of the individual elements in a sentence. To describe the structure of a language, Chomsky utilizes so-called units and rules. The units that are identified are: the sentence (S), noun phrase (NP), verb phrase (VP), noun (N), verb (V), and the determiner (Det). In the analysis of the sentence "The man delivers the order", Chomsky shows that this sentence S consists of a NP "the man" and a VP "delivers the order". The VP consists of a V "delivers" and a NP "the order". The NP consists of a Det "the" and N "man, order". These units can be represented in a tree, but Chomsky also uses a more mathematical manner the structure of the sentence:
On the basis of the analysis Chomsky formulates generative rules. According to Chomsky, these rules can be used for the automatic generation of sentences. To limit the amount of rules that are necessary for rewriting, transformational rules are introduced. The rules are classified in two categories: rewriting rules and transformational rules. With transformational rules the, more or less homogeneous, structures that are created from the units by the rewriting rules are transformed in possible other deviations. So, the description of a question involves two steps: first the use of the rewriting rule to create a basic structure, and then the transformation of the basic structure into a question. Chomsky calls the basic structure the deep structure and the transformed structure the surface structure. The usage of rewriting rules and transformational rules are beyond the scope of the current research, because the focus is on the determination of the structure of language as element in communication.

Chomsky's theory has formed the basis for linguistic oriented methods aiming at representing the meaning component of language signs. The meaning of a word or a sentence, is however, a complex phenomenon: we can decompose it down into meaning and reference, into semantic features, or into implicit or presupposed content. Meaning can also be considered in its entirety and viewed in relation to other facts that are different of nature, but nonetheless depend on linguistic linkage (Ducrot, Todorov, 1979). The linguistic methods aiming at representing the meaning of a language sign are founded in the belief that one can calculate the total meaning of a language sign if one knows the meaning of the significative units that appear in it and the syntactic relations that unite them. This is called the semantic combinatorial (Katz, Fodor, 1963). This approach is, however, not undisputed. Therefore, in the current research the meaning component is not further examined.

The representational perspective conceives language as a large set of separate sentences reducible to sentences declaratively describing a state of affairs, that, in their turn, can be divided into smaller parts. This decomposition reveals the structure for the language constructs and their constituent elements. The decomposition is performed apart from the function of a sentence. This means that, from a representational perspective, there is no difference in the structure of the following sentences:

I promise to deliver the order
I request to deliver the order

In both sentences the structure can be described as NP₁-V₁-V₂-NP₂. However, when the function of both sentences is considered, it may be observed that there is a huge difference between the sentences. The representational perspective on language is not able to highlight differences of this kind.

The difference between requesting and promising sentences is based on the identification of the function of the sentences in human interaction. The identification of differences of this kind is beyond the scope of the representational perspective, and receives attention in the functional perspective.
2.1.2 The functional perspective

The focus of the functional perspective on language is on uncovering the structural organization of linguistic constructs in light of their role in human social interaction. In this definition, the functional perspective reflects a drastic extension of the representational perspective. The structure of the language is now related to its use, and thus it is impossible to determine the structure of any linguistic construct apart from determining its meaning in a particular context, as it was possible in the representational perspective.

The functional description of language is attracting more attention in the last 20 years and is considered as an answer to Chomsky’s orthodox transformational-generative grammar (Dik, 1978). The transition period is marked by the work of Katz (Fodor, Katz, 1964; Katz, Postal, 1964) which resulted in a trend called generative semantics (see: Matthews, 1990). Although generative semantics has been popular in the 1960’s and early 1970’s, at this moment it is overshadowed by (more sophisticated) functional approaches. There is a growing body of functional oriented approaches to language based on Chomsky’s theory. Foley and Van Valin’s Role and Reference Grammar (RRG) and Halliday’s Systematic Functional Grammar are functional oriented approaches investigated by Siewierska (1991). An overview of other functional oriented Grammars can be found in Droste (1985). The functional approach I have chosen as an illustration of a method in the functional perspective is the Functional Grammar (FG) of Simon Dik (1978, 1989). The primary reason for choosing FG is because it offers a coherent and explicit model which aims to provide a complete account of the sentence structure from the underlying semantic representation to the surface phonetic form. A further reason for choosing FG is because it has recently been applied in the field of informatics (see: Gulla, 1993; Dignum, 1989; Weigand, 1989; Connolly, Dik, 1989).

Functional Grammar is a model of grammar based on the functional view of the nature of language which fully integrates structure and meaning. FG is a sentence grammar envisaged as part of a wider theory of verbal interaction and ultimately as a sub-component of a model of a natural language using system in which the human linguistic capacity is linked to epistemic, logical perceptual and social capacities (Siewierska, 1991). Dik (1978) proposes FG as a drastic elaboration of the structuralistic paradigm of linguistic theory as represented in the previous paragraph.

The functional orientation of FG is considered the heart of the theory. Whereas the adherents of the representational perspective view language as a potentially infinite set of structural descriptions independent of matter of use, the functionalists consider all aspects of the structural organization of language in the light of its role in human social interaction. Subscribing to a functional view of language entails that the rule system should, as far as possible, be described in terms of functional notions. The structure of the clause is built around the semantic relation of predicate and argument to which may be assigned three levels of functions: semantic, syntactic and pragmatic. The semantic functions correspond to what in other grammatical frameworks is called semantic or thematic roles, relations and cases,
e.g., agent, goal, recipient, etc.. The syntactic functions are subject and direct object. The pragmatic functions specify the informational status of language expressions. These include the topic, focus and tail. Of these three levels of functions only the semantic ones are obligatorily present in the underlying structure. Thus although FG is primarily a theory of syntax, its basic theoretical constructs are semantic (Siewierska, 1991).

FG decomposes any natural language into clauses and extra- clausal constituents. By clauses is meant the main and subordinate clauses of traditional grammar. Extra-clausal constituents are elements which are neither clauses nor parts of clauses. In FG each clause is characterized in terms of an abstract clause structure. The clause structure is mapped onto actual linguistic expressions by a set of expression rules specifying form, order and intonation. In the functional perspective, the focus concentrates on the underlying structure of language.

The underlying clause structure consists of several nested layers, levels and domains of organization. These nested layers, levels and domains correspond to the different communicative functions that can be identified in a total clause. The underlying structure is described in four different clause levels: predicates, predications, propositions, and messages (Weigand, 1989; Gulla, 1993).

- **Predicates** are expressions which designate properties of, or relations between entities. Entities, then, are represented as terms, which is a structure consisting of a head and an optional set of restrictors. There are derived and basic predicates. If they must be known as such if they are to be used in appropriate ways, they are called basic. They are called derived if they can be formed in regular ways by synchronically productive rules of predicate formation.

- **Predications** are created by inserting terms into predicate frames and, among other things, instantiating the frame at a spatio-temporal dimension. They denote a state of affairs, and in that sense build models of some real or imaginary world.

- **Propositions** are made up from predications and include information expressing the speaker's attitude towards the propositional content. As opposed to predications, propositions denote possible facts, something that can be true or false with respect to a certain state of affairs.

- **Messages** consist of frames of a certain illocutionary type that contains a proposition. Messages correspond to the use of language in communication processes, and in a representational perspective they provide an interface to the information to be communicated.

For more detailed information on the four different clause levels can be found in (Siewierska, 1991; Gulla, 1993; Steuten, 1996)

FG does not make the same distinction between the deep structure and the surface structure as we have observed in the transformational-generative grammar of Chomsky. In this context Siewierska (1991) calls FG a mono-level theory of clause structure because it postulates no intermediate levels of representation between the predicate argument-based layered underlying semantic structure and the visible or audible surface structure which we as users of the language are privy to. The
derivation of sentences is achieved by the gradual building up of structures. Thus a predicate frame is expanded to become an extended predication by specifying the predicates and the terms. Then the predication is extended and expanded into a proposition, and finally into a message. So, all the information required for the surface realization of a message is incorporated in the underlying structure. A schematic representation of this process is displayed in figure 2.1.

![Diagram](image)

Figure 2.1 Representational levels in FG (simplified from: Dik, 1989, p. 53)

The clause levels are illustrated with the example that I have used before. If the message “The man delivers the order” is considered, the proposition “the man has delivered the order” is identified. The predication that can be identified is “the man delivering the order”. Finally, the predicate consists of the entities: “the man” and “the order” with the relation “deliver”. The decomposition is based on a similar decomposition illustrated in Siewierska (1991).

With regard to the actual form of FG structures, the theory posits no graphical representation of structure, whether by means of constituency or dependency trees, arrow-headed arcs, relational networks or the like. The underlying structure of the clause is depicted by means of a schema, inspired by predicate logic which takes the form of a predicate frame flanked by a series of brackets and parentheses depicting the various levels of structure (Siewierska, 1991). As an illustration, the example sentence “The man delivers the order”, is transformed into a FG schema:

$$E_i[DECL[X_i[Pres e_i[deliversV(d1x_i;man(x_i))]_{Ag}(d1x_i;order(x_i))]_{Go}(e_j)]]$$

The full representation in FG of the example sentence thus contains the following parts:

$$deliverSV(d1x_i;man(x_i))_{Ag}(d1x_i;order(x_i))_{Go}(e_j)$$

represents the predication, or state of affairs, of the message, in which “Delivers” is the predicate, and “the man” (described as: definite singular) and “the order”
(definite,singular) are the terms. “The man” is considered the agent (Ag) and “the order” the goal (Go).

By adding the tense to the predication of the message, we create the proposition or the possible fact. In the case of the example, we observe a present tense (Pres):

\[ \text{Pres } e_i \text{delivers } \forall (d1x_j \text{man}(x_j) Ag(d1x_j \text{order}(x_j)) Go(e_j). \]

The last step in the clause structure is the addition of an illocutionary force marker (see: section 2.1.3). The illocutionary force of the message “The man delivers the order” is considered to be a declarative (DECL). The resulting clause structure has been presented above.

A more practicable representation of language from a functional perspective is proposed by Moutaouakil (1991). Moutaouakil presents a condensed notation for the representation of sentences at the proposition level. This means that the sentence is decomposed until the proposition level, and that more detailed analysis of the proposition is only performed when necessary. So, the expression “the man delivers the order” is represented as:

\[ \text{[DECL]} E_i : \text{[The order is delivered]}(E_i) \]

The Moutaouakil notation clearly highlights the additional value of the functional perspective over the representational perspective. To illustrate this, the Moutaouakil notation is applied to the two sentences that could not be distinguished from each other in the representational perspective:

(1) I promise to deliver the order
(2) I request to deliver the order

With the functional notation the difference between the sentences becomes clear.

(1) \[ \text{[PROM<Tag [DECL]}] E_i : \text{[The order is delivered]}(E_i) \]
(2) \[ \text{[REQ<Tag [DECL]}] E_i : \text{[The order is delivered]}(E_i) \]

The representation highlights that (1) is a promise [PROM] (stated in a declarative form), while the other is a request REQ (also stated in a declarative form).

FG as a representative of the functional perspective offers a coherent and explicit model which aims to provide a complete account of the sentence structure from the underlying semantic representation to the surface phonetic form. The thoroughness by which the analysis can be performed is an appealing feature of FG.

Although the determination of the structure of linguistic constructs in the light of human interaction is the aim of the functional perspective, the methods in the functional perspective have limitations. The methods consider linguistic expressions in isolation. This means that methods in the functional perspective will have difficulties in determining the functions of expressions where these functions depend on the context, for instance:

\[ I \text{ do} \]
\[ I \text{ will} \]
In addition when a person needs more successive sentences with the same function to make only one point, this will be lost in the representation. This is due to the fact that the functional perspective, like the representational perspective, analyses single utterances without including reference to a speaker and a hearer and their function in a conversational context. This point receives attention in the action perspective that I examine in the next section.

2.1.3 The action perspective

The last of the three perspectives on the structure of language consider here is the action perspective. The action perspective distinguishes itself from the other two perspectives by the characteristic that it examines the utterance of a grammatical sentence with a specific function as a form of human action.

The difference between the representational and functional perspectives on the one hand and the action perspective on the other hand is best explained by the Saussurian distinction between a theory of langue (the timeless, virtual rules governing the syntax and semantics of sentence types) and a theory of parole. The representational and the functional perspectives are both theories of langue while the action perspective aims to be a theory of parole. This theory of parole focuses on determination of the structure of the use of language as a particular form of human behavior. This structure has been made explicit in what has become known as Speech Act theory.

The central notion in Speech Act theory is the speech act. This notion has first been raised by Austin in the 1955 William James lectures: How To Do Things With Words in Harvard (Austin, 1962; Austin, 1970). Austin argues that to speak is not only to say something but to do something; speaking is to be considered as the performance of an act by the speaker. This is the first time the role of the speaker and the hearer comes in sight. Herewith the focus of the action perspective strongly distinguishes from the representational and functional perspective where there is no explicit interest in either the speaker or the hearer. In the Harvard lectures, Austin concentrates on a category of non-descriptive sentences which he labels variously "performative sentences", "performative utterances", or just "performatives". Performatives include such examples as: "I do (take this woman to be my lawful wedded wife)", "I name this ship the Queen Elizabeth", or "I bet you sixpence that it will rain tomorrow". Such utterances do not describe or report something; they are neither true nor false. Rather uttering one of them constitutes doing something: taking a wife, naming a ship, or laying a bet. Although these utterances cannot be true or false, they can be felicitous or infelicitous, or happy/unhappy. By these qualifications Austin means to express that a speech act may be considered correct or appropriate under particular circumstances. If, for example, a man and a woman say "I do" in a wedding ceremony, this will be infelicitous if one of them is already married to someone else.

In the course of his investigation Austin constructs a taxonomy explaining the structure of speech acts. The main distinction introduced by Austin, is a tripartite distinction between locutionary acts, illocutionary acts, and perlocutionary acts.
The *locutionary act*, that is the act of producing a form of words with sense, reference and so on. The *illocutionary act* of complementing utterances with some communicative force (e.g., as promises, warnings, assertions or requests). Finally, he refers to *perlocutionary acts* achieved by speaking: for instance, an assertion may have the perlocutionary effect of persuading the hearer that something is the case. A single utterance constitutes the performance of an act of each of these categories. If $S$ is the speaker, $H$ the hearer, $e$ an expression in language $L$, and $C$ the context of the utterance these main constituents are schematically represented as (Bach, Harnish, 1979):

- **Utterance Act:** $S$ utters $e$ from $L$ to $H$ in $C$
- **Locutionary Act:** $S$ says to $H$ in $C$ that so-and-so
- **Illocutionary Act:** $S$ does such-and-such in $C$
- **Perlocutionary Act:** $S$ affects $H$ in a certain way

These are the foundations that have been build on by John Searle in particular. Since Searle has fleshed out many of Austin’s suggestions, it is his work that receives most attention, and which will be the main focus hereafter. Searle’s first essay *Speech Acts* (Searle, 1969) grew out of his D.Phil. thesis on sense and reference, and is an attempt to elaborate Austin’s theory of speech acts. Searle states, following Austin’s line of thought, that the primary object of analysis in the philosophy of language is not, as traditionally has been thought, the sentence but the speech act, which he defines as the *uttering* of a sentence in a particular *context*. Sounds or marks on paper do not have a meaning by themselves, but it is rather the production of sounds or marks under certain conditions that makes them a means of linguistic communication. To put this point more precisely, the production of the sentence taken under certain conditions is the *illocutionary act*, and it is this act that constitutes the minimal unit of linguistic communication that is able to establish coordination of action (Searle, 1969).

Whenever a speaker utters a sentence in an appropriate context with certain intentions, he performs one or more illocutionary acts. On the basis of Austin’s work, Searle introduces the essential difference between illocutionary force $F$ and propositional content $P$ of an illocutionary act. This distinction can best be illustrated with the two utterances: “You will leave the room” and “Leave the room!” Both utterances have the same propositional content, namely that you will leave the room; but characteristically the first of these sentences has the illocutionary force of a prediction or a threat, while the second has the illocutionary force of a command. Similarly, the two utterances: “When will you see John?” and “Are you going to the movies?” both characteristically have the illocutionary force of questions but have different propositional contents. The character of an illocutionary act is entirely determined by the nature of its illocutionary force and its propositional content. Illocutionary forces are realized in the syntax of actual natural languages in a variety of ways, e.g., mood, punctuation, word-order, intonation contour, and stress, among others. Any of these elements that indicate that an utterance of a sentence has a certain illocutionary force, or range of illocutionary forces, are called *illocutionary force indicating devices* (Searle, 1969; Searle, Vanderveken, 1983).
There are three types of illocutionary acts which have been distinguished: elementary illocutionary acts, complex illocutionary acts, and acts of illocutionary denegation. Sentences of the class of elementary illocutionary acts are called elementary sentences. The general form of these acts is \( F(P) \) and its elementary act is denoted by \( f(p) \). A special class of the elementary acts are performative acts. The acts in this class consist of a performative verb used in the first person present tense of the indicative mood with an appropriate complement clause. In uttering a performative act, the speaker performs the illocutionary act with the illocutionary force named by the performative verb by way of representing himself as performing that act. Some examples of performative acts (with the performative verbs italicized) are: “I promise that the order will be delivered tomorrow”, “I request you to deliver the order tomorrow”, and “I state that the order is delivered”. Acts in the class of complex illocutionary acts are called complex acts. Complex acts are composed of elementary acts using illocutionary connectives. An illustration of a complex act is: “I promise to deliver the order at Sam’s, but will he be there to take the delivery of goods?”. In this case the speaker promises to do something and at the same time he is asking a question. A special kind of complex acts is the negation of the illocutionary force called the illocutionary denegation. Searle and Vanderveken (1985) state that a negation has two faces. Consider for example: “I promise not to deliver the order” and “I do not promise to deliver the order”. The second sentence is a typical example of the illocutionary denegation while the first is an elementary illocutionary act with a negative propositional content \( P \). Thus an act of illocutionary denegation is one whose aim is to make it explicit that the speaker does not perform a certain illocutionary act.

Following Austin’s line of thought, Searle distinguishes, next to the illocutionary acts, four other types of acts. The other acts that have been identified are: propositional acts, utterance acts, perlocutionary acts, and indirect speech acts. A propositional act is the subsidiary act of expressing the propositional content in the total process of the performance of an illocutionary act. A propositional act is an abstraction from the total illocutionary act in the sense that speaker cannot simply express a proposition and do nothing. Thus the propositional act is always a part of the illocutionary act. The utterance of expressions by which illocutionary acts are performed are called utterance acts. Utterance acts correspond with Austin’s locutionary acts. It is important to notice that not all utterance acts result in an illocutionary act. The mere uttering of sounds without a function or meaning is an utterance act, but not an illocutionary act. The third type of speech acts that is identified by Searle are the indirect speech acts. This means the performance of an implicit illocutionary act by way of performing another illocutionary act explicitly. The implicit act is called the indirect speech act. The explicitly performed act is used to convey another speech act; and the speaker relies on the background knowledge and mental capacities which he shares with the hearer in order to achieve understanding. For example the utterance: “Do you know what time it is?”, in most circumstances it would be inappropriate to respond with a simple “Yes” or “No”, which would be the answer to the explicitly performed illocutionary act. The implicit request of the speaker is: “Please tell me what time it is”. The last type of speech act that are identified by Searle are the perlocutionary acts. Searle notes that
perlocutionary acts and their perlocutionary effects have already been analyzed by Austin, and here he decides to follow Austin's line of thought.

The illocutionary force of an illocutionary act is composed of seven component elements. These components of the illocutionary force determine the conditions of successful and non defective performance of illocutionary acts.

1. **Illocutionary point.** Each type of illocution has a point or purpose which is internal to its being an act of that type. For example the point of a statement is to tell how things are. This point, or purpose, is called the illocutionary point. The illocutionary point determines the direction of fit for the propositional content and the commitments created. The direction of fit determines the 'direction' in which the propositional content matches with the world. Consider, for example, the act of stating; here the direction of fit is from the "word" to the "world", and in normal language we use the words (or equivalent words) "true" or "false" to characterize how well the matching has taken place. In requesting, the direction of fit is the opposite: the "world" is to made match the "word". Accordingly, the words "fulfilled" or "unfulfilled" may be used to characterize how well a match has been made.

Although the illocutionary point is just one of the seven component elements, it is by far the most important one.

2. **Degree of strength of the illocutionary point.** Different illocutionary acts often achieve the same illocutionary point with different degrees of strength. So, the degree of strength of ordering is stronger than the degree of strength of requesting.

3. **Mode of achievement.** The modes of achievement refer to a special way or special set of conditions under which the illocutionary point of an act has to be achieved in the performance of a speech act.

4. **Propositional content conditions.** In many cases the type of illocutionary force imposes certain conditions on what can be in the propositional content. For example, if a speaker makes a promise, the content of the promise must be that the speaker will perform some kind of future course of action.

5. **Preparatory conditions.** Preparatory conditions specify the states of affairs a speaker must presuppose to exist in the world if an intended illocutionary act is to be performed.

6. **Sincerity conditions.** Sincerity conditions refer to the psychological state the speaker is expressing when he performs an illocutionary act with a propositional content. The psychological state needs to correspond with the expressed propositional content. Thus when one makes a promise, one expresses an intention; when one issues a command, one expresses a desire or a want.

7. **Degree of strength of the sincerity conditions.** Just like the illocutionary point the sincerity conditions can be denoted by different degrees of strength.

On the basis of three of these dimensions (illocutionary point, the direction of fit, and the sincerity condition) Searle (1979) proposes five classes of illocutionary acts.
• **Assertives.** The illocutionary point of the category of assertives is to commit the speaker to the truth of the expressed proposition. The direction of fit is word-to-world, and the sincerity condition expressed is “belief that p”. An example of an assertive would be “The man has delivered the order”.

• **Directives.** The illocutionary point of the class of directives consists in the fact that they are attempts to get the hearer to do something, expressed by the propositional content (Hearer does A). The direction of fit is world-to-word, and the sincerity condition is “want that the hearer H takes a course of action establishing the truth of the expressed proposition”. “Can you deliver the order?” is an example of a directive.

• **Commissives.** Commissives are those illocutionary acts whose illocutionary point is to commit the speaker to some future course of action. The direction of fit is world-to-word, and the sincerity condition is “intend to act such that the expressed proposition becomes true”. A commissive is performed when the delivery man states: “I will deliver the order right away”.

• **Declarations.** The illocutionary point of a declarative is that its successful performance guarantees the correspondence between the proposition p and the world. The state of affairs is brought into existence by merely declaring it to exist. Because of this feature, the direction of fit is both world-to-word and word-to-world. There is no sincerity condition. A declarative is uttered when the superior of the delivery man states: “I assign you with the responsibility to deliver the order this afternoon”.

• **Expressives.** The illocutionary point of this class is to express the psychological state specified in the sincerity condition about the state of affairs specified in the propositional content. Logically, expressives do not have a direction of fit. In the line of the examples the delivery man utters an expressive when he states: “I apologize for not delivering the order this afternoon”.

In the representational and the functional perspectives well developed grammatical notation systems for the structure of language are encountered. In the action perspective a similar notation system is lacking. In Searle’s *Taxonomy of Speech Acts* (1979) he proposed a premature notation system for speech acts. An extended notation system for the action perspective can be found in the logical direction. Together with Daniel Vanderveken, Searle has started the development of a formal system of illocutionary logic in *Foundations of Illocutionary Logic* (Searle, Vanderveken, 1985). This work has been expanded on in Vanderveken (1990). Although the illocutionary logic may be thought of as a notation system for language signs in the action perspective, it is a representative of the representational perspective. Illocutionary logic is concerned with representation and reasoning about speech acts, while the focus of the action perspective is on explaining the structure of language as a form of behavior.

The main advantage of the action perspective, with the Speech Act theory as its main representative, is that it offers an initial impetus to a theory of the structure of parole. It relates language to action, and therewith the action perspective allows some preliminary understanding of communication mediated coordination of
action. In this respect I consider the action perspective an important extension to both the representational and the functional perspectives which I have addressed in the previous sections and which do not consider the possible behavioral effects of linguistic constructs. For two reasons the theory of parole as explained in the action perspective only forms an initial impetus. In the first instance because the main representative of the action perspective lacks a coherent notation system, and as far as I know, there is no other notation system available that can deal with language as a form of action. In the second instance, the theory in the action perspective does not offer an explanation for the way in which speech acts relate to each other. This point I consider essential for a theory of communication mediated coordination of action. The relation between speech acts is established in a communication process and for this reason section 2.2 will focus in detail on the structure of the communication process.

Before the communication process in greater depth, the three perspectives are summarized and compared in the next section.

2.1.4 Comparing the perspectives

When confronted with complex matters, people try to simplify and understand by breaking matters down into their component parts. This process of breaking down or decomposition continues until an elementary unit is considered to be explanatory for the understanding of the whole. Decomposition happens in every empirical science. A paradigmatic example of decomposition is the continuing search for the elementary unit that is characteristic of the history of chemistry.

Decomposition is an important principle in the analysis of natural languages. Communication is a continuous process with no unambiguous beginning or end. For the study of language this continuous process has to be decomposed in manageable segments. All the beginnings and ends are, however, arbitrarily chosen (Hopper, 1987; Coulthard, Montgomery, 1981). These segments, called units of analysis, have to be chosen in such a way that their explanatory power is of such a magnitude that they provide an explanation for the problem under study. According to Taylor and Cameron (1987) a satisfactory theory on the decomposition of language must incorporate principled and reliable criteria for dividing the ongoing language process into segments, plus a classificatory apparatus which does not leave segments unaccounted for, nor allow ad hoc categories to proliferate. To get a better understanding of scope of the three perspectives on language, they are compared on the basis of the units of analysis, the segments that are identified, and the classificatory apparatus that is at hand.

When the units of analysis are examined in the three perspectives on the structure of language, it is observed that they are defined differently. This difference is located in the definition of language that is used. The representational and the functional perspective consider language as a set of unrelated sentences, while the action perspective considers language as related exchanges of speech acts. The illustrated methods in both the representational and the functional perspective show this sentence-centeredness. The transformational-generative grammar starts the analysis
of the structure of language from the sentence which is defined as a stretch of language with a capital letter at the beginning and a full stop at the end. The sentences are then broken down into smaller segments like verb phrases, verbs, noun phrases, etc.. Functional Grammar uses a similar unit of analysis. However, in FG the units of analysis are called linguistic expressions. In spite of the different name, the beginning and end of linguistic expressions are marked by a capital letter and a full stop. In the action perspective the unit of analysis is the speech act or illocutionary act. The boundaries of a speech act are not determined by capital letters and full stops. As shown in the discussion of complex illocutionary acts, it is possible to distinguish two or even more illocutionary acts in one sentence in the representational and functional sense. In the same way it is imaginable that two or more sentences are needed to express one single illocutionary act.

All three perspectives decompose their units of analysis into smaller parts. The representational perspective identifies a deep structure and a surface structure when it analyzes a sentence. The deep structure of the sentence is decomposed in verb phrases, noun phrases, verbs, nouns and determiners. Functional Grammar uses a more complex decomposition. Although Siewierska (1991) calls the analysis with FG a mono-level analysis, the examination of this functional method shows that a surface structure and a deep structure of a sentence is determined. However, the decomposition of the structure with FG reveals more detail compared to the decomposition in the representational perspective. This is due to the fact that the scope of the analysis is broader, not only the syntax of the sentence is analyzed, but the representation of the sentence function also requires the inclusion of some semantic and some pragmatic components. In the action perspective another feature of language is added. A speech act is decomposed into two main parts: an illocutionary force and a proposition. The illocutionary force is proposed to be decomposed into seven components, but for the decomposition of the proposition no guidelines are designed.

The classification in both the representational and the functional perspective is subject to a well defined classification apparatus. Since the decomposition is guided by detailed rules, the results of the decomposition are called unambiguous. The decomposition performed by methods in the representational perspective is less exhaustive than the analyses in the functional perspective because the representational perspective only focuses on sentence construction analysis, while the functional analysis also includes the function that is expressed in the sentence. The analysis in the action perspective offers a well defined, but more ambiguous classification for the segments of speech acts. Table 2.1 summarizes the comparison of the three perspectives on language.

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2 In this part I do not make a distinction between a written sentence and a verbally uttered sentence. In a verbally uttered sentence the capital letter and the full stop can be recognized by, for example, short pauses and differences in intonation.
A Theory of Communication

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Table 2.1 Comparison of the three perspectives

The goal set in the beginning of this chapter is the development of a theory for the understanding of communication. Starting from the assumption that human communication is an ongoing process of exchanging related messages, e.g., questions and answers, requests and promises, orders and acknowledgments, it is important to recognize that the units of analysis used in the coordination of action have a relation to each other. If the perspectives are considered, three perspectives are observed that more or less analyze language as being linguistic constructs in isolation. The representational and the functional perspective are the most determined in this approach. Although they both offer a well defined classification apparatus and notation system for the analysis of individual sentences, they allow no classification between sentences. The action perspective offers no classification apparatus for propositions and only some ambiguous classification rules for the analysis of illocutions, it implies the analysis of more sentences at the time. However, it provides no rules to accomplish this. In their current state the method for the analysis of language in the action perspective is only suitable for the analysis of isolated sentences.

For the development of a theory of action coordinating communication, the action perspective provides the best possible theoretical starting point. Theoretically, it goes beyond the conception that language is a sequence of unrelated and isolated sentences by viewing language as a series of illocutionary acts. In the analysis of language I will therefore first focus on the isolation of illocutionary acts. This opens up the possibility of analyzing and categorizing language as intentions with propositions instead of propositions with intentions. Since the action perspective does not offer a method for the determination of the structure of propositions, one of the other two perspectives has to be used in addition (see also: Bach, Harnish, 1979). If a highly detailed analysis of the proposition is recommended, the action perspective needs to be combined with the detailed FG methods of the functional perspective. In all other cases it is advisable to combine the action perspective with
decompositional methods as proposed in the representational perspective or with the Moutouakil notation as discussed in the functional perspective.

Since none of the three perspectives appears to provide a full understanding of the structure of action coordinating communication as they do not elaborate in detail on the relation between sentences, a more detailed look at the communication process in which sentences are used is needed. The next section elaborates on the function of the communication process in the understanding of action coordination communication.

2.2 Communication process

In the previous section human communication is considered as an ongoing process of exchanging language signs. In the examination of the perspective on language it has become clear that there are methods to analyze the structure of language, but at the same time the mutual relationships between these language signs remains opaque. Derived from the central goal of the chapter, to develop a theory for the understanding of the structure of communication, the aim of the examination of communication processes is to establish the unit by which coordination of action between two or more persons may be achieved.

Communication models provide a means for the understanding of communication processes. A communication model is a verbal or a graphical schema in which the communication process is depicted. Fauconnier (1981) identifies four categories of communication models for four different purposes: structural models, dynamic models, functional models, and operational models. Structural communication models show the ingredients of the communication process and their relations. Dynamic communication models emphasize the evolution and changes that occur during the communication process. Functional models focus on causal relations and interaction between the elements in the communication process. Operational models are developed with the aim to measure the communication process quantitatively in order to make predictions about the process. Since the current research focuses on the structure of human communication as a dynamic process, structural and dynamic communication models will be concentrated upon, and functional and operational models of communication will be disregarded.

The examination of communication processes is guided by an extended example based on the delivery-statement that has been used in the previous section. Before the assertive “The man delivers the order” is uttered, I imagine a conversation in which the foreman asks the delivery man to deliver an order. An example of such a conversation would be:

Foreman: “Sam, will you deliver the order for DoDo Engineering Works this afternoon?”

Employee: “Yes, I’ll do it.”

In order to determine the communication unit the section first examines the communication process that is traditionally used communication theory (section 2.2.1). It is argued that this model is too limited to explain a communication process
of language signs viewed from an action perspective. In section 2.2.2 a more complex model of communication, the cyclic communication process model is introduced.

2.2.1 The linear communication perspective

It is possible to study communication in much the same way as, for example, the study of the biological systems in our body. One starts to determine which elements are involved, and then analyzes how those elements affect each other, and in this way determine the nature of the process as a whole. This approach has been followed by Shannon and Weaver (1949) in their mathematical description of the communication process. In the examination of this description I will not discuss the mathematical theory of information that is proposed in this theory, but only the underlying communication model by which they claim the transfer of information to take place. This underlying model has formed the basis for the commonly accepted model for the understanding of the structure and the dynamics of communication processes (see: e.g., Robbins, 1979; Tubbs, 1979; Barker, 1990; Taylor, 1993).

Shannon and Weaver (1949) perceive five components in their conceptual model of the communication process: an information source, a transmitter, a channel, a receiver, and a destination. The functions of the five components are best illustrated by the situation of two persons using Internet electronic mail to send a message from one to the other. Shannon and Weaver's terminology is added between brackets. The first person (source) enters the message, i.e., a sequence of symbols, he wants to transmit onto his own workstation (transmitter). When he has finished writing the message, he will send it, in transmittable symbols, through the network (channel) to the other person. The message is then received by the workstation (receiver) of that person and read by this person (destination). The source and the destination as well as the transmitter and the receiver are mirror images of each other. From this example it can be noted that the Shannon and Weaver communication process model is a technical model of communication, because they do not consider the source and the destination to be rationally acting subjects. Source and destination may be interpreted as being machines.

The pioneering work on communication by Shannon and Weaver highlighting the technical aspect of communication processes, was integrated in communication processes models that focus more on human aspects of communication. The human oriented communication process models conceptualize communication as the transfer of mental states from one person to another person. This alteration encompasses the idea that a mental state of a human source has to be expressed in a sign before it can be communicated, and that the sign has to be interpreted by the human destination. Since these communication process models, like the Shannon and Weaver model, focus on the exchange of single signs, they are called linear communication process models.

Figure 2.2 depicts the linear paradigm of communicating a mental state by one person (the speaker) to another person (the hearer). The message that the speaker has in mind is called "meaning s". The fact that this is a mental state of the speaker is
presented as a dotted line between the speaker and the "meaning s". The actual communication of the meaning proceeds in two stages. In stage one, the meaning is formulated into a sign. The process of formulation is presented by the arc from the box "meaning s" to the box "sign". The resulting sign is transmitted. As soon as the sign is recognized as a sign by the hearer, a reverse process takes place: the hearer interprets the sign into the "meaning h". This process is a mental process of the hearer, and is presented by the arc from the box "sign" to the box "meaning h". The dotted line finally, represents the relation between the mental state and the person hearer (Dietz, 1992). In addition to this communication process, Shannon and Weaver postulated the existence of noise working on the channel by which the sign is transmitted. Barker (1990) shows that noise is not limited to the channel, but works on every element and in any phase of the communication process. Barker calls this noise *barriers*. Barriers occur both randomly, i.e. for no particular reason, and systematically, i.e. with a particular goal. There are obvious and less obvious barriers working on communication. Obvious barriers are, for example, the choice of a wrong sign to convey a message, a message that is interpreted ineffectively or inaccurately by the hearer, or the existence of a very noisy environment. A less obvious barrier is an unbridgeable difference in cultural or contextual background knowledge of the speaker and the hearer (Bach, Harnish, 1979). Situations like this are, for example, often observed when a computer literate speaker tries to convey a message to a "normal" hearer, or in the situation where two people from different cultures try to understand each other on a particular culture related subject. The communication barriers are presented as dashed arcs in figure 2.2.

![Figure 2.2 The linear communication process model](image)

Communication is said to be successful if the expressed mental state of the speaker and the generated mental state of the hearer are isomorphic (Taylor, 1993).

When the short example conversation is considered in the light of the action perspective combined with the linear communication perspective, two isolated processes are observed. The action perspective shows that the foreman requests the employee Sam to deliver an order at DoDo's Engineering Works, and Sam replies by means of a speech act with a *commissive* illocutionary point to do it. The linear communication perspective identifies two distinct communication processes in this conversation. The first process is the request of the foreman (speaker) to the employee (hearer), and the second process is the promise of the employee (speaker) to the foreman (hearer). In both processes the communication is considered to be successful if the expressed mental states of the speakers are isomorphic with the
generated states of the hearers. When the first communication process is analyzed in more detail, we observe a speech act by the foreman (speaker) with the underlying structure \( f(p) \). The illocutionary point of the illocutionary force \( f \) is a directive with the performative verb request. The proposition \( p \) consist of the deliverance of the order for DoDo Engineering Works that same afternoon. The directive speech act from the foreman to the employee can be represented in the following format (speaker: performative verb, illocutionary point (proposition)):

Foreman: request, directive (the order for DoDo Engineering Works is delivered, this afternoon)

After the transformation of the speech act, they can be instantiated in the communication process model (see figure 2.3).

![Diagram](image)

Figure 2.3 An instantiation of the linear communication model

A similar transformation can be performed on the second speech act. In this situation the speaker is the employee, the foreman is the hearer, and the sign is the utterance of the “Yes, I’ll do it”. The “meaning s” and “meaning h” is formed by a commissive of the kind promise with the proposition “to do it”.

The instantiation of the short example conversation reveals two limitations of the linear communication model for the explanation of the structure of the communication of language signs viewed from an action perspective. The first problem is a well known problem. The communication model assumes the communication process to be successful when “meaning s” and “meaning h” are isomorphic. The problem is that the model does not provide an explicit way of checking whether this has been achieved. This limitation has led to the extension of the linear model with a, on cybernetics based, feedback loop (Watzlawick, et al., 1967). Generally defined, feedback is the means by which deviations of a specified goal are adjusted (Fauconnier, 1981). The feedback loop is then to be considered as a new, but related, communication process. The extension of the linear communication model with a feedback loop alters the model from a linear one-way model to a two-way model of the communication process. In the basic linear model, the communication process between two persons is perceived as either the process of person A → person B, or person B → person A. With the introduction of a feedback loop the communication process is changed by the conception of
communication as the process of person A → person B, and person B → person A. Thus, the communication process is now divided into two processes. By means of these processes is determined whether the "meaning s" and "meaning h" are identical.

The second shortcoming that is revealed when the linear communication model is applied to the short example conversation is a more difficult and a less articulated problem. If the short conversation is observed, it is possible to identify two isolated speech acts, but from an action perspective's point of view it is impossible to deny that these two speech acts have a strong relationship with each other. The second speech act is an answer to the first one. In terms of the conversation analysis the two speech acts form a kind of adjacency pair (see: Taylor, 1993; Nofsginer, 1991; Taylor, Cameron, 1987). To put it more strongly, it is argued that the first speech act is considered to be meaningless without the second speech act. If a request is made, not only a sign has to be incorporated in the speech act by which the speaker can determine whether "meaning s" is the same as the intended "meaning h" (the first problem identified), the recognition and understanding of the request as a sign also needs to be confirmed by the hearer in one way or the other. The linear communication model does not provide a way to understand this problem.

The two identified limitations of the linear communication model show that this model is not suitable for the understanding of human communication viewed from an action perspective. Some may argue that this is not surprising, because the underlying Shannon and Weaver communication process model was not designed for the purpose of human communication process modeling, on the other hand, many contemporary textbooks on communication theory present the linear communication process model as a model explaining the structure of communication. The next section elaborates these limitations further and a communication process model is introduced that overcomes the limitations of the linear communication process model.

2.2.2 The cyclic communication perspective

In the previous section it is concluded that human communication cannot be understood as being a linear process. In the first place feedback has to be integrated in the communication process model. In the second place, communication is more than the utterance of isolated speech acts. Some speech acts are related to each other and others are not. In order to understand the structure of human communication, a communication process model has to be introduced that explains both how feedback is integrated into the communication process, and how speech acts are related to each other. The current section introduces a cyclic communication process model that expands on both aspects of human communication that are mentioned above.

To illustrate the complexity of a communication process, the delivery example conversation is re-consider. Imagine the situation in which the foreman is standing in a production hall, and performs the request which has already been considered in the previous section. We know that he is addressing the request to Sam, who is
somewhere at the other end of this hall. The foreman has to attract Sam’s attention in one way or the other before he can ask Sam to deliver the order. He can cough very loudly to attract Sam’s attention (this will probably not help) or shout Sam’s name, but he can also walk to the other side of the hall and tap Sam on his shoulder. After the foreman has attracted Sam’s attention (because Sam looks up, stops the activity he is working on, and turn his head towards the speaker), he will request Sam to perform some order delivery. After the request, Sam replies that he promises to do it.

When the action aiming at attracting the other person’s attention, and the request to perform some action are considered in detail, three different action aspects can be identified (see also: Schegloff, 1972). The first action aspect that can be identified is the attention attracting aspect. The purpose of this aspect is to establish a communication possibility and a communication channel between the foreman and the employee Sam. The attention attracting aspect of action is recognized when the other person shows some kind of response. Levinson (1983) calls this a summons-answer pair to establish an open channel for talk. However, this response also needs to correspond with the intended meaning associated with the attention attracting aspect. If, for example, Sam runs away, his response is not in line with the intended meaning. So, there is a second aspect involved, that can be identified as a meaning conveying aspect of action. The meaning conveying aspect is recognized when the response corresponds with the intended response of the speaker. Finally, there is the actual speech act aspect of action by which the foreman tempts the employee to perform some future action. The speech act action is recognized when the requested future action is performed by the hearer. It can be said that by means of the first two aspects the road is paved for the actual performance of some speech act. The constellation of these three aspects is labeled as a speech action. Although I have separated the sub-acts of a speech action, it does not mean that they are always performed as individual actions. In most situations, the attention attracting and meaning conveying aspects are implicitly performed together with the speech act action. In this situation it is very difficult distinguish the different aspects.

The short example, together with the notion of speech actions allow a better understanding of the communication process involved in action coordinating communication. It is observed that there is a continuous process of action and reaction between speaker and hearer, in other words, every speech action needs a feedback of some kind. So, if the speaker utters some kind of speech action, he expects the hearer to respond, because this is the only way in which it can be determined whether “meaning s” and “meaning h” are isomorphic. Obviously, if there is no response, the speaker will not have the idea that there is a communication process. The nature of the response depends on the dominant action aspect; an action with a dominant attention attracting aspect requires an attention attracting response, a meaning conveying aspect requires signs of understanding, and speech act aspects require responses on the levels of illocution and proposition. Although all three aspects of the speech action are important, my main focus will be on the latter action aspect.
The second point that was raised concerned the existence of a relationship between the individual utterances in a communication process. The linear communication process model does not provide an adequate answer to this, because it assumes a one way-model of the communication process. On the basis of the explanation of the example, it is observed that successful communication requires a content similarity between the speech action and the response to this action, that is, the content of the response is isomorphic to the content of the request. When the example I have used in the previous section is considered again, this point can be illustrated. From the two uttered sentences

Foreman: “Sam, will you deliver the order for DoDo Engineering Works this afternoon?”

Employee: “Yes, I’ll do it.”

it is observed that “it” refers to the delivery of the order for DoDo Engineering Works that same afternoon. The illocutions of the two utterances are (of course) different. I consider this similarity in content an essential precondition for a communication process.

When the feedback and content similarity between speech actions are considered to be essential in communication process, the notion of cyclic communication processes emerges. Every new utterance or speech action needs a response by another speech action with a similar or identical content. This implies that an isolated speech action is considered to be a form of incomplete communication. The minimal entity by which a communication process takes place is formed by two related speech actions.

A result of the coupling of speech actions with isomorphic contents is the fact that we no longer can strictly identify a speaker and a hearer in one communication process. The speaker and the hearer roles are part of the linear model of communication. In a cyclic process the speaker and the hearer role are changing during the communication process. It is for this reason that I prefer to label the participants in a communication process actor A and actor B. The actors are described on the basis of their role in the communication process. In action coordinating communication, the names initiator and executor are in place. During the communication process both the initiator and the executor have, at some moment, the role of speaker and hearer.

The cyclic model of the communication process is presented in figure 2.4. The message that the actor A has in mind is called “meaning a”. As in the linear model, the connections between the mental states of the actors and the actual meanings are represented by dotted lines. The actual communication by actor A of the “meaning a” to actor B proceeds in two steps. In the first step the “meaning a” is formulated into a “sign”, this process is presented by the arc from the box with “meaning a” to the box containing “sign”. This sign can have a great variety of appearances and is not necessarily the utterance of a grammatically correct sentence as I have shown before, however, at this moment the focus of the research is on speech actions. As soon as the sign is recognized as being a sign, “actor B” will interpret it to a “meaning b”. For the sign to become meaningful in the context of communication,
"actor B" has to reply, so, the same process of formulation and interpretation between the two actors has to take place again. Only when this second step is taken, I deem this to be a communication process. Contrary to the linear communication process model, the barriers in the cyclic communication model work on the interpretation and formulation processes instead of on the boxes with the communication acts and the meanings. This change has been made on the basis of the assumption that processes can be disturbed, and states cannot.

![Diagram](image)

Figure 2.4 The cyclic communication process model

The cyclic model of a communication process provides an explanation for the function of feedback and the relationship between individual sentences. Together with an action perspective on language, it allows the understanding of communication as a related exchange of language signs structured in a communication process. This insight is a precondition for the understanding of communication mediated coordination of action, but it does not explain this coordination. The next section introduces Stamper’s semiotic framework as a means to investigate what has been achieved so far, as well as the nature of the elements which are missing.

### 2.3 The semiotic framework

The semiotic framework describes a framework for the classification of the different signs that are in use in an organization (Stamper, 1973; 1993; Liu, 1993). In the current section this framework is introduced, and applied as a frame for understanding the role the perspectives on language and the two communication process models play in an organization.

The semiotic framework is based on the threefold logico-linguistic division in syntax, semantics, and pragmatics. In the framework the threefold division is extended with three other areas; physical world, empirics, and the social world. The framework is a two layered model, with two classes of each three domains. The upper three domains classed together as the human information functions, are concerned with the use of signs, how signs function in communicating meanings and intentions, and the social consequences from the use of these signs. The lower domains, on the other hand, answer questions as to how signs are structured and
used in language, how signs are organized and transmitted, what physical properties they have, and so on. Since the semiotic framework is developed as a semiological theory of information and information systems, the lower three domains refer to technical possibilities and are therefore called the IT platform. The structure of the semiotic framework is conceptualized as a ladder in figure 2.5. The domains and the interpretation of communication in each of these domains are discussed below.

![Figure 2.5 The semiological ladder (in: Stamper, 1993)](image)

The core concept of the general theory of semiotics is the sign, and it studies signs and their life in society (Andersen, 1991). A sign can be defined as something that stands to somebody for something in some respect or capacity (Stamper, 1993). In spite of this definition, which stems from C.S. Peirce, the meaning of the sign is getting more complicated when it is related to the so-called semiotic domains. In the framework six semiotic domains are identified. Each of these domains is explained in relation to communication below.

In the physical world, signs are examined as phenomena. A sign in motion is termed a ‘signal’ and a static sign is a ‘mark’, and at the level of the physical domain the properties of signals and marks are studied. The concept “communication” at the physical world level has to be interpreted as an effective of cause-and-effect relationships. Empirics is the branch of semiotics that studies statistical properties of signs, in which the object to be studied is a collection of signals and/or marks. This idea has been explored in great detail in (Shannon, Weaver, 1949). “Communication” in the domain of empirics is included in “mutual information”, the entropy of one source conditional upon the signals at another to which it is correlated, so that when you receive a signal you can have a pretty good idea what signal was sent. Syntactics is concerned with rules of composing complex signals from simple ones. In the syntactical domain the focus is on form, regardless of how it is physically represented and regardless of any empirical or statistical properties of the language expressions in use. “Communication” is not a syntactical concept (Stamper, 1993).

The lower domains (physical world, empirics and syntactics) of the semiotic framework are concerned with technical platforms, such as hardware devices, operating systems, programming languages, etc.. The technical dimensions enable us to form utterances within some physical domain and possessing a more or less syntactic structure. The aim in the three lower domains is totally indifferent to any
human values or intentions that are associated with responsible human beings, or agents as they are named in semiotics. These human values and intentions are added in the three upper domains of the semiotic framework, these are the domains which are concerned with the human information functions that are considered to be essential to the conduct of businesses.

The **semantic** domain is concerned with the meaning of signs, where meaning operates as the operational link between signs and practical affairs. Stamper (1993) identifies two different semantic principles that implicate different meanings to the notion “meaning”. An objectivist principle assumes that meanings are mappings from syntactic structures onto objective features of a real world, which is the same for everyone and which everyone knows independently of language. A constructivist principle assumes that meanings are constructed, and continuously tested and repaired, through people using syntactic structures to organize their coordinated action. The repair is taking place when they judge that the language action relationships have failed. In the semantic domain “communication” is considered the transfer of meaningful factual knowledge. Communication is considered to be successful, if the hearer understands the sign exactly as it was intended by the speaker.

When a sign has a meaning, it can be used intentionally for certain purposes such as communication. The **pragmatic** domain is concerned with the relationships between these intentionally used signs (as meaningful utterances) and the resulting behavior of responsible agents, in a social context. The context is essential for the understanding of signs in the pragmatic domain. The other domains the context is less important, but signs used for action often have little syntax when taken out of context and the interpreter, at that concrete time and place will make pragmatic sense of the utterance. “Communication” is the key word in the pragmatic domain and therefore it is most fully explained in this domain. Communication takes place successfully when a meaningful utterance is used with a certain intention which is interpreted with the appropriate intention by the listener (Stamper, 1993).

The last domain that is identified in the semiotic framework is the **social world**. The sign that is analyzed in the social world is the conversation, which is considered as a “proper chain of speech acts” (Liu, 1993). When a conversation takes place between two or more people, a change at the social level will inevitably take place. The social domain differs from the pragmatic domain in the sense that the main interest lies in the actual, perlocutionary effect, instead of the intended effects of signs. “Communication” is considered to be a reflection of shared norms, whereas norms themselves are considered to be a biological necessity (Stamper, 1973). The process of performing speech acts is considered to be a complex process of invoking, violating, and altering social norms. Consciously or not, people interact with each other and make interpretations according to norms, although sometimes they deviate from the normatives for their own interest. Related to the communication in the social world domain, Liu (1993) distinguishes in the social world three different types of norms along the lines formal-informal and explicit-implicit. This qualification of norms is presented in table 2.2.
<table>
<thead>
<tr>
<th>Formal</th>
<th>Informal</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Explicit</strong></td>
<td>non-officially but agreed vocally, e.g., the</td>
</tr>
<tr>
<td>officially documented norms, e.g., laws, legislations, organizational</td>
<td>rule that each of the colleagues buys the</td>
</tr>
<tr>
<td>regulations</td>
<td>coffee supplies in turn</td>
</tr>
<tr>
<td><strong>Implicit</strong></td>
<td>habit or convention never vocally made, e.g., a RAC member wears formal dress for</td>
</tr>
<tr>
<td>not applicable</td>
<td>attending their meetings</td>
</tr>
</tbody>
</table>

Table 2.2 Types of norms (in: Liu, 1993)

The semiotic framework provides a framework for the identification of different appearances of signs, but does not provide an analytical framework for understanding how signs are communicated for the purpose of coordination. Sections 2.1 and 2.2 presented a foundation for an analytical theory aiming at the understanding of the structure of language and communication. This work is now related to the semiotic framework, and therewith I have a means to determine whether I have addressed the structure of all signs used by human beings in the communication. This means that both the language perspectives and the communication process perspectives are compared with the classification of signs in the semiotic framework.

The three perspectives of language I have examined in section 2.1 supply frames for the understanding of the structure of language signs. The representational perspective focuses on the determination of the form and meaning of the signs under investigation. In section 2.1.1 I have argued that representational character of a language sign related to the form is better developed than meaning component. Since the three domains in the upper half of the semiotic framework presuppose rational understanding of signs, the representational analysis of signs is mainly located in the lower half of the framework. It is only in the syntactics domain that grammatical constructs are considered, so the representational analysis applies to signs in this domain.

The linguistic oriented analysis in the functional perspective aims at the determination of the functional structure of signs. The functional structure of a linguistic construct is located in both the deep structure and the surface structure. The analysis of the deep structure is, like the representational perspective, part of the syntactics domain. However, the functional structure of a sign is mainly anchored in the surface structure. Functional Grammar clearly distinguishes propositions and functions in signs.

The main focus of the action perspective is on the identification of intentions or illocutions and the determination of their structure. Therefore this perspective is most suitable to analyze signs in the pragmatics domain. Since it distinguishes between illocutions and propositions, the analysis also concentrates partly on signs in the semantics domain. The action perspective clearly fails to provide methods to consider the deep structure it is therefore not appropriate to analyze signs of the
syntactics domain. The properties of the analysis methods for the determination of the structure of language signs in relation to the classification of signs, as described in the semiotic framework, are depicted in table 2.3. The crosses in this table denote the main scope of the three perspectives. It must, however, be recognized that the representational perspective also proposes some understanding at the semantical domain, and the functional perspective some understanding at the pragmatical level, there main focus, however is indicated by crosses in table 2.3.

The linear and the cyclic model of the communication process which I have examined in section 2.2 are two distinct models for the communication of signs. Because of the nature of the linear model, this model is suitable for the transmission of information between non-rational actors. For this reason, the linear model of communication underlies the transmission of signs in the three domains in the lower half of the semiotic framework, also called the IT platform. The cyclic model of the communication process is based on the meaning recognizing characteristics of rational acting actors. The signs that are used by these actors are located in the upper half of the semiotic framework. The scopes of the two communication process models in relation to the signs in the semiotic framework are presented in the right hand side of table 2.3.

<table>
<thead>
<tr>
<th>Human Information Functions</th>
<th>Representational Perspective</th>
<th>Functional Perspective</th>
<th>Action Perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social World</td>
<td></td>
<td></td>
<td>Cyclic communication process</td>
</tr>
<tr>
<td>Pragmatics</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Semantics</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Syntactics</td>
<td>X</td>
<td>X</td>
<td>Linear communication process</td>
</tr>
<tr>
<td>Empirics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical World</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2.3 The scope of linguistic perspectives and communication process models in relation to the classification of signs in the semiotic framework. The crosses mark the main scope of the linguistic perspectives. The scope of the two communication process model's is indicated on the right hand side.

Human communication is located in the human information functions area of the semiotic framework. Table 2.3 shows that the cyclic model of the communication process is sufficient for the understanding of the communication process in this upper half of the semiotic framework. The action perspective and the functional perspective provides a framework for the understanding of signs in the semantics and pragmatics domain of the human information functions. The mapping of the language and communication process perspectives in table 2.3 reveals that there is one domain that has not been addressed so far. In the social world domain the emphasis is put on the actual perlocutionary effects in stead of the intended effects
of signs. The signs by which actors in the social world coordinate their actions are conversations (Stamper, 1993). It is the outcome of a conversation and the way this outcome is agreed upon that is of interest.

The main purpose of a conversation is the coordination of actions between two or more interacting people in a social environment. This coordination is performed against the background of norms and believes. The previous sections only considered the structure of individual action with intentions and the way these actions are transmitted from one person to another. In the next section the theory for understanding action coordinating communication is completed by examining the structure of the signs in the social world.

2.4 Coordination

The examination of theories of language and communication has elaborated on the structure of individual language constructs, and the structure of the communication process in which these language constructs are exchanged between human beings. However, the examination of the semiotic framework revealed that both elements are not sufficient for a full understanding of the coordination of action in the social world. Language and communication processes do not explain how coordination of action is achieved. The notion of coordination of action needs to be understood on top of the understanding of language and communication processes that was developed in the previous sections. So, the exchange of speech actions in a cyclic process only provides a partial understanding of the action coordinating communication. As it is explained in the semiotic framework, the units of analysis of communication by which action is coordinated in the social world are conversations. So, in order to understand the structure of coordination in the social world, the examination has to focus on conversations. The aim of the examination of conversations is to determine the structure of the (linguistic) mechanisms by which actions in the social world are coordinated.

The current section is divided in two parts. In the first part the focus is on the examination of the theory of conversation by Grice. Nowadays, this theory is cited most frequently for the understanding of conversations as a means for coordination. By means of an example it is argued that this theory cannot explain the mechanisms responsible for coordination. As a response Habermas' theory of Communicative Action is introduced in the second part of the section (section 2.4.2). This theory distinguishes and elaborates on mechanisms that are responsible for the coordination of action.

2.4.1 Grice’s conversation analysis

Much of the recent research in conversation analysis and coordinated action is inspired by Grice’s theory of conversation (see for example: Levinson, 1983; Meijer, 1994). Grice points out that conversations are not made up of a series of disconnected remarks, rather, they are characteristically rational, cooperative events (Grice, 1975). In this respect Grice’s theory supports the line of thought I have developed so far. Grice continues with the identification of a general principle of
conversational interaction that is helping to organize participants' contributions around a common purpose. Grice calls this the Cooperative Principle. He goes on to identify a number of specific maxims and sub-maxims which fall under, and jointly make up, the force behind the cooperative principle. There are nine maxims organized into four categories: quantity, quality, relation, and manner. For a detailed discussion of these categories the reader is referred to Grice (1975). This aspect of Grice's theory of conversation focuses mainly on the interpretation of the meaning of utterances in a conversation, and I will, for this reason, not consider it in more detail.

In Leech (1983), Grice's theory is extended for the purpose of the determination of the structure of conversations. The most important extension that is made by Leech is the introduction of the Politeness Principle. This principle is motivated by the desire to maintain the social equilibrium and the friendly relations which enable us to assume that the interlocutors are being cooperative in the first place (Leech, 1983). These main principles, together with an extension of the Gricean maxims and sub-maxims, form the basis for a rhetorical model of language-use in goal-directed conversations. In this model the principles are introduced as social constraints on the communication behavior of the participants. In the model Leech also introduces the distinction between illocutionary goals and special goals. The notions in the model can best be illustrated with one of Leech's own examples (see figure 2.6). A speaker starts a conversation with the remark "Cold in here, isn't it?" Leech models the structure of the conversation as follows:

![Diagram](image)

Figure 2.6 Leech's conversational structure representation

In figure 2.6, box 1 represents the initial state of the conversation, the speaker feels cold. Box 2 represents the first intermediate state: the hearer understands that the speaker is aware of the cold. The second intermediate state is labeled box 3: the hearer realizes that the speaker would like the heater to be turned on. Box 4 is the final state: the heater is turned on and the speaker begins to feel warm. The particular actions in the conversation are marked a, b, and c. Finally three goals are identified. $G^{pp}$ represents the goal of observing the politeness principle. $G'$ represents unspecified additional goals the speaker may have, and $G$ is the illocutionary goal of getting warm. According to Leech, the cooperative principle can be found under $G'$. The speaker could have accomplished $G$ (the goal of getting warm) by any one of a variety of means. This would include saying other sentences
in place of “Cold in here, isn’t it?” According to Leech’s account, because of the speaker’s social goal of upholding the politeness principle and other rhetorical principles, he was led to choose this way of attempting to attain goal G (Taylor, Cameron, 1987).

From the example it can be concluded that Leech’s model based on Grice’s principles provides a description of the behavioral and communicational moves (explicit as well as implicit) in a conversation. However, they do not provide an explanation for the occurrence of the identified moves. In other words, both models do not provide an account for the motivation underlying the coordination of actions of the participants in a conversation. Why, for example, does the hearer turn on the heating? Is this action performed because the hearer agrees with the speaker or because there exists hierarchical power by the speaker over the hearer? What will happen when the hearer disagrees with the speaker about the temperature in the room and (initially) refuses to turn on the heating? These questions are not addressed by either Grice or Leech, but the understanding of these phenomena is crucial for the understanding of the structure of human communication mediated coordination of action.

In the next section I introduce Habermas’ theory of Communicative Action. This theory provides a conception of conversation that answers the questions raised above. It distinguishes communication-immanent mechanisms responsible for the coordination of action. Together with the understanding of language and communication processes, Habermas’ theory constitutes a theoretical framework for the understanding of the structure of communication for the purpose of the coordination of action. I consider the introduction of Habermas’ theory the last step to a full understanding of communication and its action coordinating nature.

2.4.2 Habermas’ theory of communicative action

The theory of Communicative Action of Jürgen Habermas (Habermas, 1984) introduces a theory of human action that offers an explanation of the way in which people coordinate their actions and organize society. Habermas’ aim is to develop a critical social theory that puts rationality and communication at its center (Pusey, 1987).

Habermas’ critical social theory is built on three strongly related elements. One of its main foundations is formed by the Speech Act theory (see section 2.1.3). Central in this part of the theory is the critical evaluation of the premises of the Anglo-Saxon tradition in the Speech Act theory. Habermas reworks this theory on the basis of his critique and proposes a new taxonomy of ‘communication acts’. The current section focuses on this element. The new ‘theory of communication acts’ is then extended with a theory of argumentation. An argumentation process provides, under restricted conditions, the basic cognitive and normative assumptions that form the

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3 In his reply to Searle (Habermas, 1984; 1988) Habermas introduces a taxonomy of ‘speech-actions’. However, to clearly emphasize the difference between Habermas and Searle, I prefer the term communication acts when referring to Habermas’ speech actions.
base for the communicative rationality. Central aspects in this element of Habermas’ theory are the ideal speech situation and Toulmin’s theory of Argumentation. The theory of Argumentation is dealt with in section 2.4.2.1. Finally, Habermas develops a frame for the understanding of social evolution. Central to this frame are the concepts system and lifeworld. Since my aim is not to make a critical evaluation of the social impact of organizational communication, but on the determination of its structure, I focus my attention on the first and second element of Habermas’ theory of Communicative Action. Together, these two elements provide a theoretical framework for the understanding of the structure of the signs used in the social world domain of the semiotic framework, the domain I have not addressed so far. The adoption of Habermas’ theory will also have implications for the other two domains in the human information function.

According to Habermas the mechanism responsible for the coordination of action is the criticizability of validity claims, and giving rise to negotiations about the claims made. Searle considers communication primarily as an interaction between participants who try to let one another perform actions. A speech act thus succeeds if and only if the requested course of action aimed at is taken. Herewith the theory of Communicative Action extends the Speech Act theory and defines success and failure in conversations as the results of negotiations between the participants involved in a conversation.

Central to Habermas’ theory of Communicative Action is the question of how socially acting people coordinate their actions. In order to answer this question, Habermas introduces the distinction between three action types on the axis Action Orientation and Action Situation (see table 2.4). The first type of action oriented to success is called instrumental action. Habermas calls action instrumental when it is considered under the aspect of following technical rules of action and assess the efficiency of an intervention into a complex of circumstances and events (Habermas, 1984, p. 285). In other words, instrumental action is oriented to success through the technical control of impersonal problems. In this respect it cannot be counted as social action because it is not really communicatively mediated. It is in the typical case set in written and technical languages rather than ordinary language in spoken form (Pusey, 1987). Since I am interested in the coordination of action by interacting subjects in an organization I will not consider instrumental action. The second type of action oriented to success is named strategic action. An action is called strategic when it is considered under the aspect of following rules of rational choice and assess the efficacy of influencing the decisions of a rational opponent (Habermas, 1984, p. 285). Thus, the strategic coordination of action depends on the way egocentric interests fit together. It is here that the form of action can be recognized that has a central place in the competitive individualism of liberal and utilitarian theories of society. Instrumental and strategic action are opposed by communicative action. The basic aim of communicative action is that at least two participants achieve a common definition, or consensus, of the situation in which they find themselves. So, the actions of the participants in the conversation are not coordinated by egocentric calculations, but through acts of reaching understanding (Habermas, 1984, pp. 285-286).
Table 2.4 Habermas' types of action (Habermas, 1984, p. 285)

Strategic and communicative coordination of action in organizations can be illustrated with the order-delivery example that was used in previous sections. A typical example of a strategic action would be if the foreman tells the employee to deliver a specific order at DoDo Engineering Works that same afternoon without leaving the employee the opportunity to discuss the feasibility of this delivery. When this action is coordinated communicatively, the foreman requests the employee to deliver the order in such a way that the employee can first assess whether a delivery that same day is possible. On the basis of that assessment the foreman and the employee decide together on the delivery of the order.4

Figure 2.7 Action types and their corresponding validity claims.

In both a strategic and a communicative exchange of communication acts, the speaker raises validity claims, next to the proposition, which bring coordination of action about. The action types determine the behavioral alternatives of the hearer. The dominant claim in strategic action is the claim to power. The claim to power leaves the hearer only the possibility to answer 'yes' or 'no', there is no possibility for an equal argument. In a communicative oriented communication act, three validity claims are raised by the speaker. In a communicative oriented communication act the speaker claims that what he states is true (claim to truth), that his utterance is right in relation to the recognized normative context (claim to justice), and that his manifest expression of intentions is truthful (claim to sincerity) (see figure 2.7). When engaged in communicative action, the hearer has three

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4 Habermas assumes that participants in engaged in communication posses the ability to distinguish strategic action from communicative oriented action. Examples of research elaborating on the recognition of action types can be found in: Widdershoven, 1994; Laan 1991; Laan, Holman, 1987.
behavioral alternatives. The hearer can answer 'yes' and 'no' and has also the option to reply with a 'yes, but...'. In the last alternative the hearer disagrees with one of the validity claims that has been raised by the speaker. The contesting of validity claims is an essential characteristic of communicative coordination of actions.

On the basis of the raised validity claims Habermas proposes, in the line of Searle, a taxonomy of communication acts. Habermas' taxonomy consists of four classes based on one dimension only, namely the dominant claim put forward by the speaker:

- *Imperativa*: The speaker aims at a change of the state of affairs in the objective world and attempts to let the hearer act in such a way that this change is brought about. The dominant claim is the claim to power.

- *Constativa*: The speaker asserts something about the state of affairs in the objective world. The dominant claim is the claim to truth.

- *Regulativa*: The speaker refers to a common social world, in such a way that he tries to establish an interpersonal relation that is considered to be legitimate. The dominant claim is the claim to justice.

- *Expressiva*: The speaker refers to his subjective world in such a way that he publicly discloses a lived experience. The dominant claim is the claim to sincerity.

A comparison between Searle’s and Habermas’ taxonomy of speech acts reveals the shortcomings of the Speech Act theory as a framework for the understanding of the structure of communication with the purpose to coordinate action. In the first place, Speech Act theory is incapable of distinguishing between strategic coordination of action and communicative coordination of action. Secondly, Searle fails to see that the critisizability of the validity claims, stemming from the orientation of the communication towards mutual agreement, and giving rise to the negotiations about the claims made, are the mechanisms responsible for the coordination of action. The first consequence of these two shortcomings is that the Speech Act theory overlooks several important differences. It overlooks the distinction between speech acts based on power claims and speech acts based on validity claims. It also ignores the distinction between speech acts which express a claim to justice and those which express a claim to sincerity. The second consequence is that the Speech Act theory overlooks that both requests and promises express claims to justice, since they both regulate interpersonal relations (Dietz, Widdershoven, 1991). The comparison is depicted in table 2.5.

In relation to communicative action Habermas identifies two distinct types of discussion: discussions about validity claims, and discourses. The discussion about validity claims is the most frequently observed type of discussion. When the hearer agrees on all the three validity claims that have been raised by the speaker in the communication act, it is assumed that the actors have reached a common definition of the situation in which they find themselves, and thus the communication act is successful. Before this common definition is reached, the hearer may disagree on
one (or more) of the raised validity claims. In a communicative oriented conversation, the speaker is then bound to give an account for the disputed claim. The participants now will enter into a discussion about the claim under debate. This discussion results in either a definite agreement or definite disagreement about the situation in which they find themselves. However, when the discussion about validity claims tends to move towards a definite disagreement, and thus a failure of the communication act, the actors have the possibility to initiate a second type of discussion, which Habermas calls discourse. By a discourse is meant a form of communication which is concentrated around a disputed validity claim. In discourse, the ground in which this disputed validity claim is rooted, is investigated on its justness (Habermas, 1973). The purpose of a discourse is to develop or to restore the background conditions in the communicative oriented communication. It requires that the actors suspend their immediate objectives in order to search for good reasons to justify or to disprove the claims that are under debate. Discursive activity supports critical debate and argumentation which is a basic joint in the decision making process. (Ngwenyama, Lyytinen, 1992). After the actors have agreed on the disputed validity claims they can resume their temporarily suspended communicative oriented conversation.

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<th>Assertives</th>
<th>Directives</th>
<th>Commissives</th>
<th>Expressives</th>
<th>Declaratives</th>
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<td>Searle</td>
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<td>Constativa</td>
<td>Assertive</td>
<td>Directives</td>
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<td>Assertive</td>
<td>Directives</td>
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Table 2.5 Comparison of Searle’s and Habermas’ taxonomy of acts. The columns represent the taxonomy of speech acts proposed by Searle and the rows represent Habermas’ taxonomy of communication acts; the dominant claim is added at the end. The gray rectangles represent the similarities between the two taxonomies (Dietz and Widdershoven, 1991, p. 243).

Discourses are held under strict conditions so that only the better argument may prevail. This logic of argumentation focuses on the non-deductive relations between the pragmatic units or communication acts of which arguments are composed. Three aspects are distinguished in argumentative speech in a discourse: First, it is characterized as a process aiming at convincing a "universal audience". This can only be reached under the conditions of the ideal speech situation, which have
been described in detail in Habermas (1973). Second, as soon as argumentation is considered as a procedure, the interaction is subject to special rules. According to Habermas, the discursive process of reaching understanding is normatively regulated in such a way that participants a) thematize a problematic validity claim; b) are relieved of the pressure of action and experience, in a hypothetical attitude, c) test with reasons, and only with reasons, whether the claim defended by the proponents rightfully stands or not. Finally, argumentation is viewed from a third standpoint: it has its aim to produce cogent arguments that are convincing in virtue of their intrinsic properties and with which validity claims can be redeemed and rejected. The foundations for this last aspect are formed by Toulmin’s theory of Argumentation (Toulmin, 1958).

The next section expands on Toulmin’s theory of Argumentation with the aim to introduce a proper terminology for the understanding of the structure of discourses.

### 2.4.3 The theory of argumentation

The central proposition that is argued by Stephen Toulmin in the *theory of Argumentation* (1958) is that all kinds of argumentation have a claim to rationality, and that criteria have to be created on which the validity of the argumentation is determined. These criteria depend on the nature of the problems that occur in an argument. With this proposition, Toulmin breaks with the notion that argues that there are universal norms by which the arguments in an argumentation are judged.

Toulmin interprets argumentation as an attempt to justify propositions. The utterance of a proposition is interpreted as the utterance of a *claim*. The strength of the claim depends on the quality of the arguments. The quality of the arguments is, in turn, determined by the audience. Indicators of the strength of the quality of the arguments are modal terms like; possible, impossible, necessary, or probable. Here we encounter a circular process of argumentation which aims at reaching a conclusion on the basis of ‘certain’ or ‘necessary’ arguments.

Toulmin distinguishes three stages in the justification of a conclusion of an argumentation, which he calls an *argumentative procedure*. The argumentative procedure starts with the utterance of a question. In the second phase possible solutions are examined and filtered. In the third phase the remaining possible solutions are weighed. Sometimes this will result in one best solution, but most times the best solution is selected from more than one possible solution on the basis of probability. Argumentation which involves morals or personal taste tend to become very complex, but the three stages of the argumentative procedure can still be recognized.

At the level of individual reasoning (the micro-level), Toulmin distinguishes a specific layout which occurs in three steps. The first step is the expression of a claim called conclusion (C). When someone expresses a claim, he/she has the obligation to justify this claim when it is challenged by someone else. The justification of a

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5 A comprehensive introduction of S.E. Toulmin's theory of Argumentation can be found in Eemeren, et al., 1981.
claim is performed by reference to data (D) on which the claim is founded. So, the second step is the presentation of data on which the claim is based. If the grounds are not accepted as supporting the claim by the challenger, a preliminary argument has to be presented by the initiator of the claim to prove the correctness of the grounds for the claim under debate. The third step of individual reasoning focuses on proving the appropriateness of a ground and/or the connection between a ground and the claim. This justification cannot be established by bringing forward further data, but by proposing propositions of another kind: rules, principles, inference-licenses etc.. In this step the task is no longer to strengthen the ground on which the argument is constructed, but rather to show that by taking these data as a starting point, the step to the original claim is an appropriate and legitimate one. Propositions of this kind are called warrants (W).

On the basis of these three notions, Toulmin composes the first skeleton of a pattern for analyzing arguments which depicted in figure 2.8. The relation between the data and the claim in support of which they are produced is symbolized by an arrow. The warrant is added below the arrow, indicating the authority for taking the step from data to the claim.

```
Data ---------- So, Claim
Since
Warrant
```

Figure 2.8 Basic pattern for analyzing arguments

There are different kinds of warrant that may confer different degrees of force on the conclusions they justify. Some warrants authorize accepting a claim unequivocally, given the appropriate data, others authorize one to make the step from data to conclusion either tentatively, or else subject to conditions, exceptions, or qualifications. In the first case the conclusion is qualified with the adverb ‘necessarily’, while in the second case modal qualifiers such as ‘probably’ and ‘presumably’ are in place. From this it is concluded that it is not sufficient simply to specify the data, warrant and claim. To overcome this problem Toulmin introduces modal qualifiers.

The introduction of modal qualifiers and conditions of exception make the basic pattern of an argument more complex. Modal qualifiers (M) are used by Toulmin to indicate the strength conferred by the warrant. The conditions of exception or rebuttal (R) are introduced to indicate the circumstances in which the general authority of the warrant would have to be set aside.

The last distinction made by Toulmin in the layout of arguments is the backing of warrants. In defending a claim, one may produce data, warrant and the relevant qualifications and conditions, and yet find that the challenger is still not satisfied; for he may be dubious not only about the particular argument, but about the more general question whether the warrant is acceptable at all. In this case, backing (B) is supplied for the authority of warrants. Toulmin shows that the backing we supply for
a warrant is field-dependent, so that propositions used as backing in an argument are picked from the whole universe of possible remarks.

The introduction of additional elements alter the complexity of the basic structure of arguments. The modal qualifier (Q) is added immediately beside the conclusion (C) which it qualifies. The exceptional conditions which may be capable of defeating or rebutting the warranted conclusion (R) are placed immediately below the modal qualifier. Finally, the backing is added to the layout of arguments immediately below the warrant. This extended structure of arguments is displayed in figure 2.9.

![Diagram of Argument Structure]

Figure 2.9 The extended pattern for analyzing arguments

In Toulmin (1958) guidelines are given to distinguish the different elements in an argument for the use of applying the theory of Argumentation. To use the basic pattern for the analysis of an argument, first a distinction between data and warrants has to be made. Toulmin considers warrants to be general, certifying the soundness of all arguments of the appropriate type where data are considered to be valid for the particular claim under debate. The distinction between the modal qualifier, the conditions for rebuttal, and the other elements are considered to be unambiguous.

In the extended pattern a more complex distinction, warrants are distinguished from backing because warrants are expressed as hypothetical, bridge-like statements while the backing for the warrants are categorical statements of fact. On the other side, backing is distinguished from data on the ground of the role it plays in an argument. Data is an essential element in an argument: a bare conclusion, without any data produced in its support, is no argument. But backing of the warrants invoked need not to be made explicit: the warrants may be conceded without challenge, and their backing left understood. Finally, the distinction between the backing of warrants and the qualifiers Q and R is considered to be obvious and need not to be expanded upon.

### 2.4.4 An example

In conclusion to the examination of the coordination element of the theory for the understanding of communication, the delivery-example, that was used throughout the chapter, is reconsidered. Since the recognition of the mechanisms responsible for coordination requires more detail, the example is placed into context. It was selected from a field study by the author in the building industry (for a detailed description see: Reijswoud, Rijst, 1994b, and also chapter 5).
The delivery of goods to a customer is probably the most frequently occurring type of action in industry. In this case we consider the delivery of the order with order number 432 by the end of July. The order was placed by the customer named DoDo Engineering Works with the Profiles Company, an aluminum window frames producing company. The delivery of the order is based on the negotiations between the salesman representing the company and the customer. The results of the negotiations are affirmed legally by means of a contract, which has been signed by the sales manager of the Profiles Company and, of course, by the customer.

The following conversation between the foreman and Sam, the employee, is performed against this background.

Foreman: “Sam, will you deliver the order 432 for DoDo Engineering Works this afternoon?”

Employee: “Yes, I’ll do it.”

Based on the observation of the action situation (social) and the action orientation (oriented to reaching understanding) of the conversation, the action type is Communicative. This implies that the raised validity claims may become subject of a discussion, and also that a discourse about the background conditions of the conversation is allowed to be started. The two-line conversation above between the foreman and Sam ends successfully, this means that the action will performed. In the next conversation a discussion about the claim to truth in the initial request is observed:

Foreman: “Sam, will you deliver the order 432 for DoDo Engineering Works this afternoon?”

Employee: “Yes, but are you sure that we are allowed to deliver the order this afternoon?”

Sam states that he is, in principle, willing to deliver the order, but at the same time he requests the foreman to give an account for the fact that it is true that the order may be delivered.

If the foreman and the employee cannot agree about the delivery of the order with order number 432, it may become the subject of a discourse. In a discourse, we can, for example, observe the following argument (the types of arguments are added in the first column):

<table>
<thead>
<tr>
<th>Claim</th>
<th>Data</th>
<th>Warrant</th>
</tr>
</thead>
<tbody>
<tr>
<td>An order with a particular order number will be delivered on time by the Profiles Company at customer’s</td>
<td>An order is to be delivered if a contract for the deliverance of the order has been approved by the sales manager</td>
<td>An approval of a delivery contract by the sales manager implies a commitment to deliver an order</td>
</tr>
</tbody>
</table>

What is the basis for this assumption? What does this have to do with the assumption? Is this always the case?
Rebuttal  No, only under normal circumstances. However, two or more days of extreme cold may prevent the delivery date being met.

Modal qualifier  That is correct, only under normal circumstances.

Backing  There is the law stating that a legal pursuit can be started in case of breach of contract.

So, the claim cannot be stated with 100 percent certainty? Why does the approval of the sales manager imply that an order has to be delivered? OK, I agree on these rules.

According to Toulmin theory of argumentation, the structure of this example discourse is depicted as follows (see figure 2.10):

An order with an ordernumber xxx is to be delivered to the customer Y on a date ddmmyy if the contract for delivery is signed by the sales manager

Since, An approval of a contract by the sales manager implies a commitment to deliver an order on the agreed date

On account of The law stating that legal pursuit can be initiated in case of breach of contract

So, under normal circumstances, the order with ordernumber xxx is delivered to customer Y on date ddmmyy

Unless, Two or more days of extreme cold prevent from working outdoors

Figure 2.10 The structure of a discourse about the delivery of an order

2.5 Conclusions

In this chapter I have presented a theory of communication. This theory builds on three elements, namely, language, communication process, and coordination. The language sign is conceptualized as the means by which people communicate. This means has been examined from three different perspectives with distinct methods, resulting in three different pictures emphasizing distinct aspects of its structure. The exchange of language is performed in a communication process. The linear communication process model explains communication as the exchange of isolated language signs. I have shown that the communication process is more complex, and I have proposed a more complex model; the cyclic communication process model.

In this communication process model language signs are exchanged in mutually related pairs. The examination of the semiotic framework highlighted that communication also involves the coordination of action in the social world. The
action coordinating element of communication has been explained with Habermas' theory of Communicative Action.

The theory of communication that is presented in this chapter provides a more detailed and more sophisticated understanding of communication than the traditional theories used in informatics. Traditionally, communication is perceived as the mere exchange of information. It is shown that communication is not only a means to exchange information, but that it is also a means to coordinate action between the participants involved. The mechanisms responsible for this coordination can be identified in the language sign that is used and that is embedded in a cyclic communication process.

In the next chapter the focus is narrowed down to organizational communication or business communication. The theory of communication that has been described in this chapter is applied to the communication in business organizations. The purpose of the next chapter is to develop a model that provides an understanding of business communication.
3
A Model of Business Communication

In the previous chapter a theory for understanding the structure of communication has been outlined. This theory has been proposed as a response to the traditional conception of communication as a mere transmitter of information, that is commonly accepted in the area of informatics. The structure of communication has been described in three interrelated parts, the structure of language, the communication process, and the coordination of action in the social world. In this chapter the focus narrows down to a sub-set of the domain of human communication; communication in organizations and in particular business transactions.

"At the most elementary level the purpose of organizations can be described as the coordination of the efforts of people working on a collaborative task that has been broken down into a set of specialized activities. The sum of these activities represents the capacity of an organization. The coordination in the organization is achieved through communication" (Taylor, 1993).

Although there exist many different definitions of organizations and organizational work, I prefer to use this definition because it emphasizes the importance of the action coordinating aspect of communication, and its role in the functioning of organizations. The heart of this definition is formed by the idea of communication as a means to coordinate activities in an organization. Without communication, Taylor
states, no organization can exist. This definition and the view it incorporates, forms the background for the following examination of organizational communication.

The aim of the current chapter is to provide a detailed understanding of the action coordinating nature of the communication used by the workers in organizations. Since communication in organizations constitutes a subset of human communication, this understanding is necessarily achieved against the background of the general theory of communication that has been presented in the previous chapter. The result of this examination of communication in organizations is presented in the form of the Transaction Process Model. This model is a theoretical model offering a meta-structure explaining how communicative coordination of activities in organizations is, and can be achieved.

Before the presentation of the Transaction Process Model, the relationship between organization, coordination, and communication will be examined in section 3.1. This section elaborates on the relation between mechanisms for the coordination of organizational activities and the role of communication. This relation is strongly influenced by the type of organization, and therefore contrasting organizational models are considered. In section 3.2, three organizational modeling approaches are introduced. These approaches are unique in the sense that all three consider communication as the main object of their modeling effort. Each of the three approaches considers businesses to consist of networks of communication and highlights the interrelationship between the different business communication processes. The examination of the three approaches focuses mainly on the underlying conceptualization of communication. In section 3.3, the theory of communication and the understanding of organizational communication are integrated in the transaction process model. The chapter ends with some conclusions in section 3.4.

3.1 Organizations: communication and coordination of activities

Taylor’s definition of the purpose of organization states that the coordination of tasks is achieved by communication, but he does not expand on the relationship between communication and coordination in organizations in detail. The purpose of this section is to examine the relation between communication and coordination in organizations in more detail.

This section starts with an examination of some coordination mechanisms that have been proposed in the literature. These mechanisms describe different ways to coordinate the efforts of people working on a collaborative task. The influential research on organizations conducted by March and Simon is introduced to show the relation between coordination and communication. Based on this relationship five categories of communication in organizations are elicited. In section 3.1.2, I continue with the examination of two competing views of organization and organizational forms corresponding with these views. This constitutes the basis for a characterization of communication in organizations based on Habermas’ distinction between strategic and communicative oriented action.
3.1.1 Communication mediated coordination of activities

The literature on organizations has put forward different organizational mechanisms that facilitate the coordination of activities. One of the first modern theories on organization that is explicit about the coordination of activities and coordination mechanisms is the influential study conducted by March and Simon (1958). This study forms the basis for many, more recent, theories on organizational mechanisms for the coordination of activities.

March and Simon identify three organizational coordination mechanisms by which the efforts of people working on a collaborative task can be coordinated: coordination by standardization, coordination by plan, and coordination by feedback. The coordination by standardization involves the establishment of routines, or rules, which constrain the efforts of the people working in an organization and leads these efforts into paths consistent with those of others in an interdependent organizational relationship working on the same collaborative task. Coordination by standardization requires a relatively stable and repetitive organizational environment. The second form of organizational coordination, called coordination by plan, involves the establishment of schedules by which the activities in an organization are performed. Coordination by plan does not require the same high degree of stability and routinization that is required for coordination by standardization. This characteristic makes coordination by plan a more appropriate mechanism for organizations operating in unstable environments. The last form of coordination of the efforts of people is called coordination by feedback. This coordination mechanism involves the transmission of new information during the performance of the activities belonging to the collaborative task. This means that the efforts of the people working on a particular task are constantly adjusted by new information. The more variable and unpredictable the tasks of an organization are, the greater the reliance on coordination by feedback. These three types of coordination, in the order introduced above, place increasingly heavier burdens on organizational communication. Standardization requires less frequent decisions and thus a smaller volume of communication during a specific period than coordination by plan, and coordination by plan calls less decision making and communication than coordination by feedback (March, Simon, 1958).

A frequently cited extension to the March and Simon’s mechanisms for the coordination of activities in organizations is provided by the work of Mintzberg (1983; 1989). Mintzberg identifies six activity coordinating mechanisms:

- **Mutual adjustment** achieves coordination by the simple process of informal communication
- **Direct supervision** achieves coordination by having one person to issue orders or instructions to several others whose work interrelates
- **Standardization of work processes** involves coordination by specifying the work processes of people carrying out interrelated tasks
- **Standardization of output** achieves coordination by specifying the results of the work.
• *Standardization of skills and knowledge* achieves coordination of work by virtue of the related training the workers have received.

• *Standardization of norms* in which the norms infusing the tasks are controlled, usually for the entire organization, so that everyone functions according to the same set of beliefs.

Mintzberg states that these mechanisms are the glue that holds organizations together, and associates them in five types of organizational structures (see Mintzberg, 1983; 1989).

Although Mintzberg’s schema provides a more differentiated set of mechanisms for the coordination of the efforts of workers of an organization than March and Simon’s taxonomy, the basic idea, that tasks and activities in organizations can be coordinated by different means, is the same. The coordination mechanism that is in use in an actual organization is, however, always a mixture of two or more mechanisms. A major difference between the work on coordination of March and Simon, and Mintzberg is, that the former considers coordination in conjunction with communication, while the latter not only leaves aside the role of communication but moves on to the identification of organizational structures. Mintzberg’s conception of the role of communication in the coordination of organizational tasks is adopted in many contemporary textbook literature on informatics and organizations. (E.g., Winfield, 1991; Heijndijk, 1990; Davis, Olsen, 1984). With the theory of communication in mind one can see that Mintzberg uses a standard and thus very limited definition of communication. As far as Mintzberg considers communication, he considers this to be solely responsible for information transfer. For this reason, Mintzberg’s taxonomy of coordination mechanisms is not considered to contribute to a better understanding of organizational communication.

In their analysis of organizations March and Simon identify five different categories of organizational communication involved in the coordination of activities:

1. Communication for non-programmed activity.
2. Communication to initiate and establish programs, including day-to-day adjustment or “coordination” of programs.
3. Communication to provide data for the application of strategies (i.e., required for the execution of programs).
4. Communication to invoke programs (i.e., communication that serves as “stimulus”).
5. Communication to provide information on the results of activities.

Although March and Simon did not consider the relationship between the individual communication categories and the three coordination mechanisms, this relationship is worth considering in more detail. In order to bring the connection between communication categories and coordination mechanisms to the forefront, I slightly redefine and rename March and Simon’s organizational communication categories below.

The first category, communication for non-programmed activity, was defined as a catchall category by March and Simon because, contrary to the other four
categories, it contains those communications which cannot be related immediately to the primary process of the organization. Following Taylor (1993), I prefer to rename this category *informal communication*, in order to emphasize that this communication is similar to the other types of communication in an organization, with the difference that it is not primarily contributing to the formal goal of the organization, and as such does not appear in the texts that are produced by an organization. March and Simon's second category contained communication by which the preconditions for the efficient and effective performance of the organizational tasks and activities were created. This type of communication is frequently observed in management meetings. For this reason this category is renamed *precondition creating coordination*. The remaining communication categories are more easy to understand when it is recognized that they are strongly related to each other. These categories contain the communication by which a business executes its primary processes. By means of the communication to invoke programs, specific tasks are started. Therefore this category has been renamed *action initiating communication*. The result of a specific activity is reported by means of March and Simon's communication to provide information on the results of activities. This category has been renamed to *action reporting communication*. If additional information is needed to perform a specific task, 'communication to provide data' is used. In order to bring the relation between communication and coordination to the front, this category has been renamed *information providing communication*. On the basis of their function I propose the following five categories of organizational communication:

1. Informal communication
2. Precondition creating communication
3. Information providing communication
4. Action initiating communication
5. Action reporting communication

When these categories are related to the three coordination mechanisms, it can be expected that businesses that are predominantly coordinated by standardization exhibit a high volume of sophisticated communication in category 2. Much time and energy is put in the development and maintenance of rules, regulations and procedures. The goal they try to accomplish by this communication is to minimize communication in the categories 3-5. When coordination by plan is used as the dominant coordination mechanism, a slight decrease of type 2 communication is expected to be observed, while information providing communication will increase. Since the activities in these organizations are less standardized, more information is needed for the initiation of an action. This trend is followed in organizations where tasks are predominantly coordinated by feedback. Minimal communication in category 2 is observed while the volume in communication in the category 3 is extensive. For every activity new information is needed, because there exists no routine, it is also expected to observe a significant higher volume of information providing communication than in organization coordinated by mainly standardization or plan. There is expected to be no connection between the type of coordination mechanism used in an organization and volume of action initiating
and action reporting communication. These two categories of organizational communication relate directly to the core process of the business, and will only change when this process of a business is changed.

The remaining part of the research concentrates on all communication in an organization, except the communication belonging to the category informal communication. When the terms “organizational communication” or “business communication” are used, I refer to action initiating, action reporting, information providing, and precondition creating communication. The reason for this restriction is not guided by the hypothesis that informal communication is fundamentally different from the communication under study, but only to limit the scope of the research in order to obtain a more manageable research object.

3.1.2 Organizations and communication

The behavior of organizations is described and explained in many ways. The different scientific disciplines that are interested in organizations have their own conceptual frameworks of explaining their behavior. The research investigating the behavior of organizations has resulted in several classifications of organizational forms. This section discusses the distinction between classical and emergent organizations. The distinction relates to the perceived stability of organizational and environmental structures. Parallel to this division mechanistic and organic organizational forms are discussed. These organizational forms are distinguished on the basis of organizational controlling mechanisms. At the end of this section both distinctions are used for the characterization of action coordinating communication in organizations based on the distinction between strategic and communicative oriented action.

Organizations and organizational behavior can be described in terms of the stability of the internal organizational structure as well as the external environment in which the organizations operate. This is the essence of the difference between classical and neoclassical forms of organization on the one side, and emergent forms of organization on the other side. The adherents of the classical and neo-classical description of organizations believe in the existence of a priori structures in an organization and in its environment. The organization needs to be designed in such a manner that it does not conflict with these structures. Adherents of emergent theories of organization advocate constant change in and outside the organizations, and consequently, an organization is in a constant process of adaptation to these changing conditions. I start with the examination of the two views underlying classical and emergent forms of organization.

The classical view on the behavior of organizations has long been the dominant view in organizational literature. The foundation for the classical view is located in the organizational analyses of Weber (1947) and Taylor (1911). In spite of the fact that Taylor's work is directed toward management of organizations and Weber's work has a more normative nature, they both share the same set of general assumptions underlying their view of organizations (Morgan, 1986). In the first place, they both assume that workers in an organization are motivated by economic
needs and they consider personnel as a constant rather than a variable in the organizational system. Secondly, organized work systems are seen as simple hierarchies of specialized tasks. Third, formal systems are presumed to dominate informal structures because authority is legalistically determined and legitimized. Finally and most importantly, in the classical view organizations are perceived as stable systems of rules and traditions. By adopting this set of beliefs, they exclude organizational change caused by internal forces.

The classical view considers the bureaucracy as the most efficient form of organization. Weber (1947) provides a definition of the bureaucracy that nicely illustrates the classical view of organization. He defines a bureaucracy as a form of organization that emphasizes precision, speed, clarity, regularity, reliability, and efficiency achieved through the creation of a fixed division of tasks, hierarchical supervision, and detailed rules and regulations. The definition aims at emphasizing the static part of an organization, instead of emphasizing the dynamic processes that take place. The bureaucracy is perceived as a fixed network of functional parts, like departments. These high-level parts are further specified as fixed networks of precisely defined jobs. These jobs are organized in a hierarchical manner through precisely defined lines of command, communication, coordination and control. These mechanisms ensure the communication to travel top-down through the organization in a precisely determined way, to create a precisely determined effect. Communication traveling from the worker to the management is excluded from this view. Changes in the organization are perceived as rational choices made by the top-management.

In the line of thought of the classical idea of stability, neoclassical equilibrium models are found. In recent years these equilibrium models have gained a lot of attention (Truex, 1993). The general characteristic of these models is the notion that an organization must be in balance with its environment. This environment is considered to be orderly and the organization needs to identify the order in the surrounding environment and adjust itself to it. The neoclassical models perceive the environment to be stable, ordered and knowledgeable to a certain extend. By adjusting to the stability of the environment, the organization can reach an equilibrium with its environment and is therewith controllable. Equilibrium models have taken two principle forms: those that were developed on the basis of economic equilibrium and those based on the notions of ecological equilibrium (Truex, 1993). Agency Theory (Eisenhardt, 1989) and Transaction Cost Theory (Williamson, 1979) are representatives of the first category. Agency theory defines organizational behavior by explicit and implicit contractual relationships between parties. The notion of a contract is used to describe an 'agency relationship', a relationship in which one party (a principal) delegates work to another party (an agent) who performs the work. The Transaction Cost Theory is a branch of the Agency Theory in which firms and markets are seen as alternative forms of contracting in which transaction costs are the primary focus. An organization is defined as any stable pattern of transactions between individuals or aggregations of individuals (Ouchi, 1980). Contingency Theory is a representative of the equilibrium models based on ecological equilibrium. This theory arises from the notion that organizations are
open systems and must adjust their internal structures to stable environmental circumstances.

The dominant object of study in both the classical and the neoclassical view on organizations is the isolation of stabilizing functions of rules and regulations inside the organization or stable factors of its environment. The theorists of these views assume that organizations and their environments have a hidden and intrinsic structure; a so-called a priori structure and this structure can be isolated. It is important to note that the assumption of an a priori structure of organizations and/or their environment may narrow the observer’s understanding of the organizational dynamics, especially those dynamics that are caused by, and associated with, organizational communication.

The classical and neoclassical view of organization is contrasted by the emergent view of organizations. The emergent line of thinking is related to the social construction of reality (e.g., Berger and Luckman, 1966; Pickering, 1992; Jasenoff et al., 1995) which argues against the existence of a priori structures. The fixed structures in the classical and neoclassical view are replaced by the notion of emergent regularities; structures always in process but never fully formed.

The concept of emergent social systems builds upon the belief that human systems do not follow fixed patterns; rather, human systems always exhibit the potential for change and are always in the process of change. They are not deterministic and do not follow fixed causal patterns, instead, they are products of constant social negotiation and consensus building. The notion of emergent behaviors reflects this distinction and maintains that human systems are in the process of moving towards structure and may exhibit temporal regularities of behavior, but are never fixed or structured. One can only observe the emergent regularities because unchanging or fixed relationships do not exist. This emergent social systems thought emphasizes that human systems and thus organizations have emergent needs.

The emergent social systems thought has lead to an emergent view of organizations. The emergent view considers an organization to be in a constant state of formation, devolution, reformation and evolution. It is fluid, flexible, adaptive, open and attuned to its constantly changing environment. The emergent view denies the existence of rigid boundaries between an organization and its environment. The emergent organization either avoids rigid structure and bureaucracy or prides itself in growing by dividing. Its structures are modular, decentralized, allow innovation, create custom vs. standardized decisions, are in reformation and self-examination, are disposable and literally interactive. This ‘new’ organization is positioned for change and rapid adaptation (Truex, 1993).

The emergent view of organizations is slowly receiving more attention in field of organizational sciences. A comprehensive overview of recent research of emergent organizational forms and especially in respect to the implications for information systems development can be found in Truex (1993). Without repeating this overview there are two examples of emergent organizational forms that need to be mentioned. The first is the semi-permanent organization as described by Huber (1991) that provides an illustrative account of the careful description of emergent
forms of organization. The organizations described by Huber are less governed by rules and complex contractual relationships but instead by the building of trust, forbearance, and systems of tacit learning. These semi-permanent organization's internal forms mirror the external environment's complexity. However, the best description of the emergent organizational form can be found in the Flux and Transformation image of Gareth Morgan (1987, pp. 233-272). This image is one of the eight metaphors Morgan offers for ‘reading’ an organization. The starting point of the flux and transformation image is the notion that the universe is in a constant state of flux or flow, embodying both permanence and change. Underlying the surface of our perceived reality there are hidden processes. Morgan calls them ‘logics of change’. He discusses three images of change that each provide a way of explaining how the reality of organization may be embedded in the logic of change itself.

Parallel to the classical and emergent view of organization we find Burns and Stalker's (1961) influential study on mechanistic and organic forms of organization. This distinction is based on the dominant control mechanisms in an organization. The central premise of Burns and Stalker is that as rates of environmental change vary, organizations need different systems of control, information conveyance, and authorization. On the extremes of a continuum the authors locate two forms of organization: mechanistic and organic organizations. Mechanistic forms of organization are characterized by hierarchical control. Mechanistic organizations operate in stable environments, which purportedly afford these organizations a relatively high level of control over tasks. Organic organizational forms are characterized by dispersed control over tasks. This characteristic allows organic organizations to operate under unstable environmental conditions, where task accomplishment and innovation shifts to the most knowledgeable parties in the organization. The bureaucracy is considered to be the prototype of the mechanistic organizational form while self-managing teams reflect the characteristics of organic organizations (Courtright, et al., 1989).

Mechanistic and organic forms of organization show a high degree of similarity with organizational forms based on classical and emergent views of organization. The mechanistic organization can be seen to be founded in classical or neo-classical theories of organization. Both classical forms of organization and mechanistic organizations assume that there are a priori structures in their environment that can be known and controlled. Both attune their organizational structure to the a priori structures. The organic organization is similar to the emergent organization with respect to the fact that both focus on organizational change. However, a difference between the two forms is that organic organizations consider change a conscious choice while emergent organizations consider change inherent to the idea of organization.

In the light of mechanistic and organic organizational forms, the characteristics of organizational communication in the classical and emergent view of organization can be determined. Classical and neoclassical views of organization consider communication to be a means for top-down control of the efforts of the individuals working in an organization, this is also called the chain of command. According to
Courtright et al. (1989) this communication behavior involves a managerial command style in which managers' instructions and decisions govern work operations. Communication tends to be one-way, or top-down, since managerial instructions dictate what subordinates do. Managers place greater emphasis on setting directions and defining the limits to action than on feedback and negotiation (Weick, 1987). The adherents of the mechanistic assume that in a bureaucracy communication proceeds unchanged from the top of the organization to the bottom where a requested action is performed. In other words, communication is the tool by which the higher echelons control the performance of the lower echelons in an organization, and can therefore be considered as one of the available powertools of the management in an organization. If this is interpreted in Habermas' action types, the communication exhibits a strategic orientation. Not mutual understanding but success and hierarchical control are the leading motives for communication in the classical and neoclassical understanding of organization. On the other hand, in the emergent view of organizations communication is considered to be the tool by which an organization is built, altered, and maintained. Identifiable patterns of communication are characterized by consultation, discussion and negotiation (Courtright, et al., 1989). In the emergent organization all knowledgeable contributors participate in decision making. Together with a departure from hierarchical control, this leads managers to adopt consultative communication forms. According to Weick (1987, p. 116), when managers consult they “offer options, listen, paraphrase, question, advise and then allow the target of the consultation make whatever decision seems sensible”. A second characteristic of emergent organizations is the emphasis on discussion and negotiation. Discussion and negotiation are a means by which consensus is achieved, a consensus that is negotiated over and over again. The communication that is used in an organization is a reflection of the communication that is used in other parts of society, and therefore constantly introducing new insights, altered rules and changed regulations. Moreover, by means of communication, people are influencing each other's behavior explicitly or implicitly. So, communication is not one of the processes that takes place in an organization, it is the organization. The dominant form of organizational communication in emergent and organic organizations is communicative oriented communication of which discourses are an integral part.

For the reasons mentioned above, I believe that it is important to consider the organizational form when organizational communication is investigated. Organizational communication is highly determined by organizational forms. A confirmation of this view for the specific situation of planning public services can be found in Forester (1989); a more general investigation is provided by Mumby (1988).

It is important to recognize that classical and emergent as well as mechanistic and organic views of organization represent the opposite poles of a continuum. They describe extremes. So is the relation between organizational forms and communication. There exists no organization that exhibits only strategic oriented action, or communicative oriented action. It is always a mixture between these two types of action. However, predominant mechanistic organizations show
predominantly strategic action while predominant organic organizations show predominantly communicative oriented action. This point is illustrated in figure 3.1.

![Organizational forms and the dominant action orientation of communication](image)

Figure 3.1 Organizational forms and the dominant action orientation of communication

Until now I have used the term organizational communication without reference to the possible modes in which communication appears in the organization. According to Taylor (1993) organizational communication can be divided in two modes with each their own characteristics. The two modes of communication that are distinguished by Taylor are conversation and text. Most exchanges between people in organizations are mediated by talk, but a significant proportion is also consigned through paper (Cullen, 1995; Winfield, 1991). According to Taylor, studies on text-based communication, like memos or minutes, have been systematically neglected in the literature on organizations. This is remarkable because the relationship between conversation and text in an organization cannot be denied.

Conversation is always situation-specific: it involves definite people, in a definite place, at a definite time. In a conversation, information is constantly being generated, both by messages and by the situation, in interaction. Conversations take place in episodes. For the Speech Act theory these episodes are speech acts, while the Functional Grammar identifies linguistic expressions. Texts, on the other hand, are the words that are written down and make a statement of some official standing. According to Taylor, texts are always based on some kind of conversation. A text is meant to be consulted, and referred to, and to be accessible to people. Therefore texts are considered to have fixed properties across situations. At the same time it has to be noted that a text is the work of an author, in a particular situation, who incorporates private opinions to some extent. Private opinions are not always explicit in the text, but are always present. The decoding of the text occurs within a context of conversation. Taylor notes that this conversation is not necessarily between people, it may also be internalized by a so-called ‘inside-the-head’ conversation. When the text is decoded in a different context, it is not to say that the interpreter interprets the text as it is meant by the author. The decoding of a text does not allow an interactive interpretation between writer and reader, and this be the cause of misinterpretations.
Since organizational communication takes place by both by means conversations and texts, the analysis of communication in organizations needs to focus on both modes. However, my primary focus is on conversations as they take place as a means to coordinate the tasks in an organization. I consider texts complementary to conversations.

So far I have shown that there exists a complex relationship between organization, coordination and communication. The coordination of the efforts of the people working in an organization is mediated by communication. However, not all communication is aiming at coordinating efforts that belong to the collaborative task of the organization. This collaborative task, also called the core process of a business (Dietz, 1993), is coordinated by action initiating and action reporting communication. These two types of communication are supplemented by information providing and precondition creating communication. The final category of communication, informal communication, will not be considered within the scope of this research. When communication was examined in relation to forms of organization, it was argued that communication in bureaucratic organizations has a predominant strategic orientation, while the same communication in emergent or organic organizational forms has a predominantly communicative orientation. The section was concluded with a brief examination of the modes in which communication in organization appears.

In spite of the fact that I have identified two categories of organizational communication that coordinate activities, their relation to the actual coordination of organizational activities remains opaque. The next section elaborates on this relationship in more detail and proposes basic communication action patterns of organizational communication.

3.2 Conceptualizing and modeling business communication

The purpose of communication in organizations is to coordinate the efforts of the people working on a collaborative task. In the previous section I have distinguished categories of organizational communication, however, the question as to how these categories relate to each other, and how they relate to the actual coordination of action in an organization has not been considered. In the current section I introduce three speech act based organizational modeling approaches. These approaches conceptualize organizations as communication networks. They each are built on a specific interpretation of organizational communication, and they each propose communication patterns by which business processes take place and can be analyzed. In the course of this section I introduce these approaches in general terms, but I put emphasis on their interpretation of the structure of organizational communication.

The section starts with the examination of the Conversation for Action approach as initiated by the work of Flores and Ludlow. Then it continues with a discussion of the SAMPO approach as developed at the University of Jyväskylä, and finally it examines the DEMO approach as proposed by Dietz. In a final section the three approaches are compared with each other and with the theory of communication
that was discussed in the previous chapter. This comparison forms the basis for the transaction process model which is presented in section 3.3.

3.2.1 The Conversation for Action approach

In 1980, Flores and Ludlow (1980) reported on a systematic study of the activities of people working in offices. Contrary to the accepted quantitative research that reports on statistical distributions of activities of all kinds of groups in different forms of organizations, Flores and Ludlow used a qualitative method to determine the nature of office work. The essence of office work, they concluded, is the continuous process of communication between the workers in an office in which commitments are created and processed. Therefore they propose to perceive organizations as networks of inter-related commitments. This view differs from the, by that time, undisputed idea that organizational behavior could be described and explained in terms of information flows and data manipulations. In this idea communication was considered to be merely the transmission of information from one place to another. As I have argued before, this view is still observed in much of the literature on organizations.

The research was performed against the background of the Speech Act theory of language as examined in chapter 2. The adoption of this theory allowed the researchers to argue that the question “What are people doing in an office” is not significantly different from the question “What is the function of communication in an office”. The authors argue that the work of people in offices is reducible to the utterance of directive, commissive, assertive, and declarative speech acts that bring forth four different kinds of commitments for speakers and hearers (Flores, Ludlow, 1980, p. 109). The directives and commissives are described to appear in pairs while the assertive and declarative speech acts are uttered in isolation. The fifth class of speech acts that was identified by Searle, the expressives, is left out the discussion. A good reason for this exclusion is not provided. The initial impetus to “commitment analysis” by Flores and Ludlow was extended in greater detail by Winograd and Flores (1986).

In regard to the conceptualization of organizational communication, the work of Winograd and Flores implies a shift from commitment to conversational analysis. They note that the individual speech acts uttered in an organizational context are not unrelated events, but participate in larger conversational structures. Successive speech acts are now related to one another in a pattern through time. In an organizational context four different kinds of conversation are identified: the conversation for action, the conversation for clarification, conversation for possibilities, and the conversation for orientation. The conversations for action is considered to be the central coordinating structure for human organization (Winograd, 1988; Murray, 1991). The conversation for action is conceptualized as an interplay of requests and commissives directed towards explicit cooperative action. On the basis of observational research they conclude that managers engage in many short conversations in which they create, take care of, and initiate new commitments within the organization (Winograd, Flores, 1986). In other words,
managers engage in conversations for action. However, not only managers are engaged in conversations for action, at all levels in an organization there is coordination of work processes by means of conversations for action (Winograd, 1988). The coordination of action by means of communication, also called the performative conversation, is considered to be the backbone of every organization. Without these conversations there exists no coordination of work processes in organizations.

The basic course of the conversation for action as a pattern through time is plotted in figure 3.2. The conversation for action is initiated by a request (directive) from person A to person B. This request specifies the conditions of satisfaction in the proposition. These conditions characterize the future course of action by B. Following the request, there are three alternatives for person B:

1. accepting the conditions and promising to satisfy them by means of a commissive speech act;
2. declining and thereby ending the conversation;
3. counter-offering with alternative conditions of satisfaction.

Then, each of these options in turn has similar continuations (e.g. after a counter-offer, person A can accept, cancel the request, or counter-offer in return). During state 3 the requested action is performed and B reports that he has completed the action. When A considers the action to be in accordance with the requested conditions of satisfaction, he accepts the result, and declares that the conversation for action is completed (state 5).

![Diagram](image)

Figure 3.2 State transition diagram representing a conversation for action initiated by a request from speaker A to B. The circles represent conversation states and the labeled lines represent speech acts. Heavy circles represent states of completion. (Winograd, 1988).

The conversations for clarification, possibilities, and orientation are considered to go along with conversations for action. Winograd (1988) notes that there is no sharp line between these three conversation, but they are accompanied by different
moods. In a *conversation for clarification*, the participants cope with or anticipate breakdowns\(^1\) concerning interpretations of the conditions of satisfaction expressed in the conversation for action. These conditions are interpreted with respect to an implicit shared background, but in reality the sharing is partial and differences in interpretations need to be negotiated. In a *conversation for possibilities*, the mood is one of speculation, anticipating the subsequent generation of conversations for action that emerge in the course of the conversation. Meetings are best conducted in this mood. In a conversation for orientation the mood is one of creating a (new) shared background as a basis for future interpretation of conversations. The shared background includes specific knowledge, interpersonal relations, and general attitudes.

Although Winograd notes that each of the four types of conversation has its own regularities of structure, just like the conversation for action, this structure remains implicit in all publications. However, the conversation types have formed the basis for the development of a computer mediated communication system called **THE COORDINATOR**\(^\circ\). This CMCS is examined in detail in chapter 7.

A recent extension and application of the conversation for action philosophy is found in the field of work flow management. On the basis of the conversation for action philosophy a "Business Design Language" has been developed by Action Technologies (Medina-Mora, et al., 1992; Schäl, Zeller, 1993). Although the Business Design Language is based on the language/action perspective, it does not restrict the possible moves to a rigid and given set of utterances. The basic unit by which organizational communication takes place is a four step action workflow protocol as depicted in figure 3.3. The black arrows present the client's speech acts and the gray arrows the supplier's speech acts. Although the names "client" and "supplier" only suggests inter-organizational communication, the protocol describes also intra-organizational communication like communication between different departments in an organization, or different workers in one department (Schäl, 1995).

This conversational flow in the action workflow protocol is transversal through the phases of opening, commitment, performance and closing. In the opening phase the customer asks for a service or product. In the second phase (commitment phase), the performer in the action workflow agrees to fulfill a specific condition which s/he negotiates with the customer to meet a corresponding condition of satisfaction. In the performance phase, the supplier performs the work which leads to the delivery of the requested service or product. The final phase (closing phase) closes the loop and involves the supplier's acknowledgment or formal declaration of satisfaction after receiving the service or product. At its simplest, this declaration is a "thank you" or a payment for the service or product. Although the conversations can be composed of various related communications, the basic conversational flow can always be identified (Schäl, 1993).

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\(^1\) The notion of breakdown needs to be interpreted with regard to the philosophy of Heidegger. "Objects and properties are not inherent in the world, but arise only in an event of breaking down in which they become present-at-hand."
Figure 3.3 The basic action workflow protocol (Medina-Mora, et al., 1992)

Like the conceptualization of organizational communication by Winograd and Flores, the Business Design Language identifies four different types of conversations. The central conversation is called Commitment to Do. This type of conversation subsumes all conversations in which people discuss a commitment for doing an action. The second type of conversation is the Commitment to Be which consists of conversations for possibility. Information Handling conversations are opened to delegate someone to manage an information base. Finally, the Information

Figure 3.4 State transition diagrams representing Commitment to Do and Commitment to Be conversations initiated by a request from a customer to a supplier. The circles represent conversation states and the black arcs speech acts by the client, and gray arcs speech acts by the supplier (Agostini, et al., 1994; Agostini, et al., 1993).
Providing conversation is used to give or request information. Both the Information Handling conversation and the Information Providing conversation are considered to be subclasses of the Commitment to Do conversation and the Commitment to Be conversation (Agostini, et al., 1994).

Each of the conversations has an internal communication process structure. Like the conversation for action, the internal structure of these conversations is represented by state transition diagrams. The structure of the Commitment to Do conversation and the Commitment to Be conversation are depicted in figure 3.4. The two conversations of the client and supplier in the workflow protocol have been mapped on top of each other.

The structure of the Commitment to Do conversation is integrated in a prototype of a CMCS called UTUCS (User To User Communication Support) that supports groups of persons inter-connected in a communication network in handling workflow conversations (Agostini, et al., 1994). The UTUCS system will be discussed in chapter 7.

3.2.2 The SAMPO approach

The second approach of conceptualizing action coordinating communication for the purpose of modeling businesses is the SAMPO approach, developed at the University of Jyväskylä in Finland. SAMPO is an acronym for Speech-Act-based office Modeling aPprOach (Auramäki, et al., 1988) and also Speech Act-based information analysis Methodology with compUtEr-aided tOols (Lehtinen, Lyytinen, 1986; Auramäki, et al., 1991). SAMPO studies organizational activities as a series of speech acts creating, maintaining, modifying, reporting, and terminating commitments and offers a method for modeling organizations as systems of communicative action. The approach uses concepts of the Speech Act theory and Discourse Analysis for conceptualizing organizational communication.

The SAMPO approach is founded in an action based model of information systems (Lehtinen, Lyytinen, 1986). Although the authors propose the model as a technical information system specification method, it is also suitable for the specification of information systems and thus organizational behavior. The model is based on the transaction cost theory (Williamson, 1979) originating from the field of organizational theory, and language theories in the action perspective. Both contributions allow the view that organizational behavior consists of commitments created by the utterance of speech acts constituting transacting processes.

The action based model entails two domains: the entity domain (ED) and the action domain (AD) together constituting the Universe of Discourse (UoD). The ED comprises of static entities that persist over longer periods of time. These entities can be items of transaction like articles, or agents like suppliers and clients. The AD includes dynamic entities called acts. The acts are necessary parts of any transacting process because they determine what can be exchanged. Two distinct types of acts are studied: Instrumental acts (IACTS) and Speech acts (SACTS). IACTS are human deeds that accomplish changes in the ED. SACTS are the basic units of human communication that result in linguistic expressions having an unambiguous,
recognized "meaning". SACTS can trigger instrumental acts, e.g., by initiating
transacting processes like issuing an order, or expressing resulting states in the UoD,
e.g., announcing the level of stock after shipment, or control and report transacting
processes e.g., by writing a shipping slip or a report of daily deliveries (Lehtinen,

Based on the illocutionary logic, as proposed by Searle and Vanderveken (1985),
the action based model postulates a detailed structure of speech acts. In conformity
with the Speech Act theory, the action based model distinguishes four "subacts" of a
speech act: an utterance act, an illocutionary act, a propositional act, and a
perlocutionary act. The illocutionary act is considered to be the most important act
in the understanding of organizational communication. The structure of an
elementary illocutionary act is presented formally in the form:

\[ \text{ill\_act (\langle context \rangle, \langle illocutionary force \rangle, \langle content \rangle)} \]

The *content* refers to the propositional content of the utterance and is expressed in
the usual clause form of predicate logic. The content constituent of an illocutionary
act can contain one or many propositions. Initial states of SACTS are defined by the
context of utterance. This context includes all those elements that are necessary to
interpret the meaning of the SACTS unambiguously. In the action based model five
constituents of the context are identified:

\[ \text{context (\langle speaker \rangle, \langle hearer \rangle, \langle time \rangle, \langle place \rangle, \langle possible world \rangle)} \]

The *speaker* and the *hearer* are defined through internal organizational positions
and through external agents that are relevant to transacting processes. *Time* is
defined by temporal coordinates, and *place* by spatial coordinates. These four
constituents together define the context in which the illocutionary act is uttered. The
*possible world* refers to the residual features of the context that are relevant to the
successful performance of the act. The possible world is something more than the
"actual world", and enables to talk of "what could be" (e.g., the future). Typical
constituents of the possible world include the presupposed authority of the speaker,
speaker's and hearer's presuppositions of what has happened and what is possible
in the world, and so on (Auramäki, et al., 1988, p. 129). The *illocutionary force* is
the last fundamental element of an illocutionary act and determines the
commitments established and the way in which the content relates to the world. The
seven components of the illocutionary force are summarized in section 2.1.3. In the
action based model, three of these components are considered to be crucial in
describing an illocution: the illocutionary point, propositional content conditions,
and prepyatory conditions.

Like the Conversation for Action approach, the authors in the action based model / SAMPO
project realize that speech acts are not unrelated events, and use insights from
theories of conversational analysis to understand this phenomenon. Elements
from discourse analysis are introduced to reveal the mechanisms that keep the
sentence flow coherent and allow the discourse to proceed in a rational rule-
governed manner. A discourse is defined as any sustained stretch of elementary or
complex speech acts. The speech act sequences, called discourses, are understood
through the analysis with the discourse concepts: discourse types, speech act
patterns, discourse segments, moves, and topicalization. A discourse type is considered to be the largest unit of human communication in an organization. A discourse type fulfills organizational goals that can be identified. The goals may be unambiguous (e.g., invoicing a client) or ambiguous (e.g., determining the corporate strategy for the next five years). A speech act pattern is an ordered sequence that forms a logical whole. Speech acts imply a specific set of alternatives by which they can be succeeded in a speech act pattern. These alternatives form a stage in a discourse. For example, a question can open a stage in a discourse in which alternatives are an answer, a clarification request, a refusal, or a counter-question. Stages in speech act patterns are grouped into larger discourse segments that share a common topicalization and have a subgoal that is relevant to achieving the purpose of the discourse type. Segments are important to the analysis of coherency, topicalization, and control flow of the discourse. Moves are speech acts that activate stages in a discourse. By topicalization, those aspects of an utterance are identified that are put into focus in a stage of a discourse process. The topicalization changes when the illocutionary force, the propositional content, or both are changed. A change in the propositional content usually indicates a new discourse segment, whereas the change in illocutionary force deals with the evolution, creation, exchange, and reporting of commitments in the same discourse segment (Auranmäki, et al., 1988).

SAMPO introduces an analysis and modeling method for discourses in organizations in which the above examined aspects of organizational communication are integrated. After an analysis of the quality of discourses, in which coherency, completeness, and ambiguity is defined, two main graphical models are proposed. The first model is the discourse graph. This model describes the overall structure of the discourse, delineates discourse objects and their properties and relationships. It can be seen to represent a partial "script" or "schema" for organizational communication. The graph defines necessary and sufficient conversation possibilities for each discourse participant. The conversation graph is introduced to characterize the dynamic discourse features. It describes the stages and moves in a conversation as well as predicates (or conditions) that restrict and control the performance of acts. For a further explanation of the SAMPO modeling approach the reader is referred to (Auranmäki, et al., 1988; Auranmäki, et al., 1992; Rijst, Reijswoud, 1995).

3.2.3 DEMO and the transaction concept

The third method of conceptualizing organizational communication for the purpose of modeling communication mediated coordination of action in businesses is the DEMO approach. DEMO is an acronym for Dynamic Essential Modeling of Organizations. It is the name of a cross-disciplinary theory describing and explaining the communicational dynamics of organizations, as well as an analysis method based on that theory. The disciplines from which it draws are the philosophical branches of semantics and scientific ontology (Bunge, 1979), and the social theory grounded in language philosophy (Searle, 1969; Habermas, 1981). Next to these, it incorporates the discrete dynamic system theory as described in
Dietz (1990). A relevant set of fragments describing the theory is constituted by
(Dietz, 1994a; 1994b; 1995a; 1995b).

In organizations one cannot only observe actions of persons and the effects of their
actions on the world, but also processes of mutual influencing between persons
who negotiate for the sake of agreeing on plans for, and results of, future action. On
the basis of these observations Dietz (1990; 1995b) introduces two distinct worlds:
the object world and the intersubject world. The intersubject world is defined as the
part of the universe that is affected by the performative acts of the subjects.² These
acts are also called intersubjective acts. The object world is that part of the universe
that is affected by the other, outwardly directed, actions. To distinguish the
intersubjective acts of the subjects from the acts affecting the object world, the latter
are called objective acts. The intersubject world and the object world together
constitute the universe of discourse; it comprises everything the communication
among the subjects is about. Next to the intersubject world and the object world the
term subject system is introduced. The subject system is defined as the system of
acting, and of influencing and influenced subjects. With these three notions an
organization is defined as a subject system together with its corresponding
intersubject world and object world.

The objective acts and the intersubjective acts performed by the subjects in an
organization are interrelated in a recurrent pattern. This pattern is called transaction.
A transaction is a pattern of activity that is performed by two actors. By actor is
understood the role of active element played by a subject in a subject system. One
of the actors is called the initiator of the transaction while the other is called the
executor. A transaction is a sequence of three phases: the inception phase, the
action phase and the conclusion phase. Figure 3.5 exhibits this structure. The
inception phase is an actagenic conversation concerning some proposition P. In this
phase two actors come to an agreement about the future objective act by the
executor of the transaction. The actagenic conversation is initiated by actor A,
starting at t1 and ending on t2. The actagenic conversation consist of two
interrelated intersubjective acts: a directive and a commissive speech act. During
the action phase, somewhere between t2 and t3, the objective act itself is executed
by actor B. In the conclusion phase, consisting of a factagenic conversation, the
initiator and executor reach agreement about the result as brought about in the
execution phase. The factagenic conversation takes place between t3 and t4 and
consists of a statutive (assertive) and an acceptable (declarative) speech act.

The result of the inception phase is also called an agendum, literally something to
be done, for the executor. To indicate the effect of the complete transaction on the
object world, the word ‘fact’ is included in figure 3.5. Its position at time t4 needs
some explanation, since this result is actually achieved somewhere between t2 and
t3. The explanation is that the result of the execution of an objective act only
becomes known to the subject system, thus in the true sense only comes to

² A subject is a human being in his or her quality of active social individual. This means an individual
who is conscious of the surrounding object world, who acts in that world with responsibility towards
fellow subjects and who responsibly interacts with the fellow subjects.
existence, if and as soon as the actors agree on the result. The underlying thought is that what counts is not what really happens, but what is stated (and accepted) about it by responsible subjects (Dietz, 1995b). It is also important to distinguish between original and derived facts. An original fact can only be created as the result of the successful completion of a transaction, while a derived fact is a fact of which the corresponding proposition is computed on the basis of other propositions and according to some derivation rule. The creation of an original fact requires subjects with authority and responsibility, while a derived fact is principally ‘brought about’ as soon as its ingredient facts are brought about.

![Diagram of a transaction between two actors](image)

Figure 3.5 The basic pattern of a transaction between an actor A and B (Dietz, 1994b).

The transaction is a specific organizational communication and action pattern that is considered to establish the heart of any business. This means that every action in an organization is embedded in transactional communication sequences, and that every established fact is the result of the successful carrying through of such a communication sequence (Dietz, 1994b). The behavior of a business is perceived to show itself in the actors that are permanently trying to get through their list of objective agenda (plural of agenda) and intersubjective agenda, also called communicanda. This means that an actor constantly loops two cycles, the objective action cycle and the intersubjective action cycle. Both are displayed in figure 3.6.

![Objective and intersubjective action cycles](image)

Figure 3.6 The actor cycles (in: Dietz, 1995b)
Next to the actagenic and factagenic conversations identified in business transactions, collectively called performative conversations, DEMO distinguishes informative conversations. The outcome of an informative conversation is not the creation of information, but the reproduction of already created information. The effect of the informative conversation is that already existing factual knowledge of one actor is shared by another. The informative conversation is considered to be supplemental to the transaction. For the execution of some transactions, the facts created in other transaction are necessary, without this information the transaction cannot be executed. DEMO conceptualizes this informative conversation as a request for information (question) and an assertive (answer).

In DEMO intersubjective acts are represented in a so called explicit notation (Dietz, 1994b; Steuten, 1996). The notation is composed of three basic elements: the actor, the illocution and the proposition.

\[ \text{actor}: \text{illocution}, \text{proposition} \]

The proposition is divided into a future action and a time for completion. The individual intersubjective acts are grouped together as a conversation if the individual acts aim at defining and reaching one particular goal. The goal is expressed in the proposition, thus intersubjective acts with an identical proposition constitute one conversation, and actagenic and factagenic conversation with identical propositions form one transaction.

In DEMO an organization is conceptualized as a system of mutual influencing actors. The actors are defined as business functions. Two kinds of mutual influencing between actors are distinguished: interaction and interstriction. Interaction between two actors is said to take place if one of the actors is the initiator and the other actor the executor of the same transaction type. Interstriction between actors takes place when already created facts or statuses of current transactions are taken into account in carrying out a transaction. Through interaction actors activate each other, through interstriction they restrict each other’s playing field. Interaction and interstriction together constitute the structure of the organization (Dietz, 1994a).

On top of this theory of organizational communication DEMO, provides a modeling method constituting four graphical models: the communication model, fact model the process model and behavior model. The communication model is the specification of (elementary) actors in the organization and their interaction and interstriction structure. The facts model is the specification of the state space and process space of the object world of the organization. The process model specifies the relationships between the transaction, and the behavior model is the specification of the behavior rules of the actors of the organization. Examples of the application of the three models to case studies are found in (Rijst, Reijswoud, 1995; Rijst, Dietz, 1993; Reijswoud, Rijst, 1995a).

3.2.4 Comparing and evaluating the three approaches

The three informatical theories considered are all three theories that expand in more detail on organizational communication and its action coordinating nature. The
basic premise of all three theories is that action coordinating communication establishes the heart of a business, and they specify a, more or less, detailed communication pattern by which business processes take place.

When the theories are related to the five categories of organizational communication, proposed in section 3.1.2, it is observed that all three exclude informal communication and only focus on communication related to the primary goal of a business. The core of communication patterns that are proposed, is formed by action initiating and action reporting communication. In the DEMO approach the distinction between actagenic and factagenic conversation corresponds to organizational communication categories; action initiating and action reporting communication. In the Conversation for Action approach the action initiating communication is located in the opening and commitment phases, and action reporting communication in the performance and closing phases. In the SAMPO approach the two categories of organizational communication are recognized as specific SACTS, but become only explicit in the actual modeling tools. The examination also shows that the conversation for possibility, as distinguished in the Conversation for Action approach, is a way to incorporate precondition creating communication. The DEMO approach, on the other hand, integrates information providing communication by introducing the notion of interstriction. None of the theories is related to specific organizational forms. They all consider communication to be an universal structure in every organization or business.

The Conversation for Action approach, SAMPO, and DEMO are three approaches that perceive organizations and organizational behavior as networks of communicative action. This means that they are consistent with Taylor's definition of organization. All three approaches use the Speech Act theory as an important source of inspiration and propose a theory and modeling method for organizational communication networks based on the Speech Act theory. The Conversation for Action approach can be said to have the longest tradition. With regard to the level of abstraction of the original theoretical concepts in the Speech Act theory it can be noticed that the SAMPO approach stays very close to the original notions while the two other approaches abstract from the original notions to a larger extent.

All three approaches consider speech acts not to be their main units of analysis, but consider them to be the constituent parts of larger communication structures. In the Conversation for Action approach speech acts are the elements of four different types of conversations grouped by their purpose in the organization. The SAMPO approach does not introduce a taxonomy of conversation, but considers speech acts to be elements of a business discourse. The DEMO approach groups speech acts into three kinds of conversations; the actagenic and factagenic conversation together constituting the (essential) transaction, and the informative conversation. Both the transaction concept in DEMO as well as the four conversation types in the Conversation for Action approach are clearly defined patterns of speech acts, while the discourse in the SAMPO approach is a loosely defined pattern that cannot be described in advance, but only established on the basis of observation of the business situation.
All three approaches identify more than one element in a speech act. Both the Conversation for Action approach and DEMO consider speech acts to be composed of three inter-related elements, namely: a speaker, an illocution, and a proposition. The speech acts in the action based model underlying SAMPO are defined along the lines of the illocutionary logic of Searle and Vanderveken (1985) and exhibit a more complex structure, because elements constituting the context are incorporated. In principle this higher level of detail allows a good characterization of a speech act, however, the literature on SAMPO does not provide explicit tools for the transformation of everyday natural language into the more formalized definition of the speech acts as proposed. In contrast to the DEMO approach where this transformation is explicated (Dietz, 1994b).

The Conversation for Action approach distinguishes itself from the other two approaches in the sense that this method has elaborated on the internal communication process structure of conversations. The possible steps in the "conversational dance" are depicted by means of a state transition diagram technique. In the most recent stage of the Conversation for Action approach two detailed models for the Commitment to Do and the Commitment to Be conversations are used to describe the process structure of the conversations. The main reason for this attempt to model the process structure of conversations is located in the aim of the researchers to use the theory for the design of computer mediated communication systems. I consider the attempt to describe the possible communication steps in a conversation very important, and it forms an important starting point for the structure model of action coordinating communication that I will develop in the next section. The representation of the process structure allows the creation of a much richer picture of the structure of communication mediated coordination of action in organizations.

The SAMPO and DEMO approaches focus on both communication and action while the Conversation for Action approach solely focuses on communication. SAMPO conceptualizes the performance of a requested action as an instrumental act (IACTS) that exist next to speech acts (SACTS). DEMO has incorporated the performance of an action as one of the three phases in the transaction concept.

The differences and similarities between the three approaches are summarized in table 3.1 below.

Having highlighted the differences between the three speech act based approaches for conceptualizing and modeling of organizational communication, the paragraph continues to compare the three approaches with the theory of communication that was presented in the previous chapter. The purpose of this comparison is to show the extent to which the three approaches incorporate the communication elements at the levels of language, communication process and coordination. This comparison forms the basis for a process model representing the structure of organizational communication that incorporates all necessary elements of human communication. This process model is proposed as an extension to the three speech act based theories on organizational communication. The comparison of the communication perspectives of the three theories follows the line of the previous
chapter, so first the approaches’ perspective on language is examined, and then the
communication process that is assumed, and finally the way in which coordination
is integrated.

<table>
<thead>
<tr>
<th>Conversation for Action</th>
<th>SAMPO</th>
<th>DEMO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit of analysis</td>
<td>types of conversations</td>
<td>conversations in general</td>
</tr>
<tr>
<td>Elements of a speech act</td>
<td>&lt;speaker/hearer&gt;:</td>
<td>&lt;context&gt; &lt;illocution&gt;</td>
</tr>
<tr>
<td></td>
<td>&lt;illocution&gt;</td>
<td>&lt;content&gt;</td>
</tr>
<tr>
<td>Communication structure model</td>
<td>detailed models</td>
<td>none</td>
</tr>
<tr>
<td>Modeling focus</td>
<td>communication</td>
<td>communication and objective action</td>
</tr>
</tbody>
</table>

Table 3.1 Comparison of three speech act based theories on organizational communication

Since all three approaches are founded in the Speech Act theory of Austin and Searle, their main perspective is an action perspective on language. All three approaches focus on pragmatic functions of language in an organization; they examine language as a form of (organizational) behavior. This is best recognized in the fact that all three approaches consider speech acts to be composed of propositions and illocutions. The Conversation for Action approach and the DEMO approach limit their decomposition of the structure of language to this point. The SAMPO approach on the other hand, extends the decomposition of speech acts with elements of the context. Although the action perspective can be perfectly combined with a mechanical or functional perspective, none of the methods focus their attention in detail on a mechanical or functional decomposition of organizational language. This means that the deep structure of speech acts is not revealed.

From a communication process point of view, it is observed that the three approaches agree on the fact that speech acts cannot be considered as isolated speech events, they are not explicit about the communication perspective they assume. When Flores and Ludlow first investigated the work in offices, they noticed speech act pairs; they observed that requests are followed by commissives. They consider propositional similarity to be the binding factor between speech acts. This observation is very important, because it implicitly assumes a cyclic communication perspective. The Conversation for Action approach has followed this path ever since. In DEMO a similar perspective is observed because similarity in the propositional content of different speech acts is presumed to indicate one transaction process. In the SAMPO approach it is more difficult to determine the communication perspective. Although SAMPO focuses on speech acts uttered in a conversational context, they do not seem to identify some kind of binding factor at the speech act level. Although, they do consider discourses on particular subjects.
However, I consider this not to be an alternative to identifying communication process at an individual speech act level.

The last aspect that was distinguished in the theory of communication, are the mechanisms responsible for the coordination of action in the social world. It was argued that the identification of conversations alone does not provide an answer to the coordination of action by means of communication. Habermas' idea of language immanent validity claims and communication types was introduced to explain the mechanism of coordination. None of the three approaches is explicit about other action coordinating mechanisms than illocutionary acts. All three approaches identify illocutionary forces as the main action coordinating mechanisms. However, the comparison of the three theories showed that the Conversation for Action approach is most firmly founded in Speech Act theory and therewith looses sight of what really brings about the coordination of action (Dietz, Widdershoven, 1991). This limits the usability of this approach greatly. Although the SAMPO approach extends the Speech Act theory with elements from Discourse Analysis, it does not provide an adequate answer to what mechanisms bring about the coordination of action in the social world. Although the structure of the DEMO transaction does not yet provide an explicit solution to question what brings about the coordination of action, its two distinct conversation parts provide a good opening for incorporating Habermas' action coordinating mechanisms.

To summarize, it is noted that the three theories provide useful tools for understanding the structure of organizational communication, but up to now none of them provides a full account of the structure of organizational communication. Nevertheless, the three approaches provide powerful concepts and tools that allow better insight into the structure of action coordinating communication. The Conversation for Action approach introduces state transition diagrams to represent the process structure of communication. I consider this to be a very powerful tool, because it allows a more detailed understanding of the structure of communication. The DEMO approach introduces the transactional concept consisting of two negotiation phases before and after the execution of an objective action, called an instrumental action in the SAMPO approach. These two phases and the instrumental action constitute a specific subset of organizational communication, namely the action coordinating communication that relates to the core business process.

3.3 Formalizing the transaction process

In the comparison and evaluation in the previous section it was concluded that the three organizational communication modeling approaches do not provide a full understanding of the structure of the action coordinating nature of organization communication. The Conversation for Action approach and the SAMPO approach are unable to provide this understanding because they are solely founded in the Speech Act theory, while the transaction concept as proposed in the DEMO approach presumes an understanding of organizational communication that includes linguistic coordination of action in the social world, but does not elaborate on this understanding.
The current section elaborates on the DEMO transaction concept and develops a model of business communication that provides a full understanding of its action coordinating nature. The model, called the Transaction Process Model (TPM), extends the transaction concept on the basis of the theory of communication that was explained in chapter 2. In analogy to the Conversation for Action approach, the structure of business communication in the TPM is expressed by means of the state transition diagram technique. Since this technique for modeling dynamic processes has not been developed for the modeling of communication processes, I have decided to redefine the form and the meaning of some of its concepts to make it suitable for communication modeling.

The section has the following structure: paragraph 3.3.1 elaborates on the form and meaning of the state transition diagram technique and proposes some modifications. In paragraph 3.3.2 the basic components of the Transaction Process Model are introduced, and in paragraph 3.3.3 the process structure of the Transaction Process Model is explained. The chapter finishes with some concluding remarks and hypotheses for the application of the model in some field studies.

### 3.3.1 State Transition Diagrams for communication modeling

The transaction is perceived as a business communication process that takes place in a specific system (organization) against the background of a certain period of time. This transaction process is a discrete process of the subjects in a subject system in which states, transitions and events can be identified. In other words, a time series of states is called a process.

A state is defined as a set of facts. A state has a duration, this means that it occupies an interval of time. Normally, this duration is not predictable. A transition is defined as a change of a state in the process. Although nothing is really instantaneous, I consider a transition to have no duration. The occurrence of a transition at a particular moment is defined as an event. Like transitions, events have no duration. Transitions and events, and states are duals of one another; a transition and an event separate two states, and a state separates two transitions and two events.

A commonly accepted way to model the states, transitions and events in a transaction process is the State Transition Diagram (STD) technique that is used for the modeling of dynamic processes (Embley, Kurtz, et al., 1992; Rumbaugh, 1991; Harel, 1987). A state transition diagram specifies the state sequence, or phases, in a dynamic process, as well as the relations between the states or phases. In this representation technique rounded boxes are used to represent states, arcs represent transitions, and labels above the arcs are added to describe the events. Figure 3.7 depicts the form and the meaning of this representation and figure 3.8 illustrates the representation with a fragment of the game of chess.
For the purpose of representing the transaction process, the semantics of the symbols in the original STD technique need to be redefined. In the previous section I have shown the general structure of the transaction and decided to use the transaction as the basic entity of organizational communication. The transaction process is a defined sequence of communication acts and transaction states guided by a specific goal; the creation of a fact, in other words, the state in which something has been completed successfully. The original state transition technique is designed for the modeling of behavior of objects in the object world, however, I will apply this technique to represent communication behavior of subjects in the intersubject world. This means that I have to redefine the symbols against the background of the transaction process. The main components of the transaction process are communication acts and transaction states. These components appear in turn on an axis of time. This pattern has been illustrated in section 3.2.3. Although there is a difference between the objects of modeling, the basic behavioral characteristics of these two main components in the transaction process are identical to the behavior of objects in the object world. This means that the allowed syntax of the original symbols remains the same. The redefinition of the state transition technique focuses on the meaning of the symbols. A rounded box representing a state in the object world corresponds to a transaction state in the transaction process and the transitions from one transaction state to the next are caused by a communication acts. So the labeled arcs in the new model represent communication acts causing these transitions.
The labeled arcs and the rounded boxes representing communication acts and transaction states are the main elements for the modeling of transaction processes, but in addition to these elements I propose to use some other elements that are needed to represent a transaction process. I use a special symbol to indicate the start of a transaction process. The Conversation for Action approach does not use a distinction between the first and the subsequent states in their representations of the conversation. This is a misrepresentation. In a transaction process, as well as in one of the conversations in the Conversation for Action approach, the first state is an empty state. This initial state only indicates that a communication pattern, whether this is a transaction or some other kind of conversation, comes into existence in the intersubjective world. This implies that there are no related prior transaction states belonging to the same transaction process. In this sense the initial state has to be distinguished from the other transaction states. Since the final state of a transaction process exhibits the special characteristic that it allows no new communication acts to be started from this transaction state, it is important to distinguish this state from the other states in the transaction process. To indicate the final state, I use the notation, as introduced in the Conversation for Action approach, and represent the final state by a bold box. The last basic symbol that needs to be included to represent a complete transaction process has to represent the objective act. The Conversation for Action does not provide a symbol, because it does not consider instrumental actions. Nor does the original STD technique provide a symbol because the method does not use the distinction between an object and subject world. Since this is an important component and therefore the instrumental action becomes an important component of the general structure of the transaction, and the instrumental action is not identical to transaction states, I propose to use a gray colored rounded box and a gray colored arc. The box represents an action state while the arc represents the actual performance of the action. The symbols are summarized in figure 3.9.

In figure 3.10 the described symbols are applied to represent the basic communication action pattern of the transaction as proposed by Dietz (1994a; 1994b). The transaction states are represented by the numbered boxes. The gray box and arc OA (Objective Act) represent the performance of the objective act and the final transaction state 5 is represented by a heavy box. The communication acts causing the transition from one to the next transaction state are labeled CA_n. Below the representation of the transaction process I have added an axis of time corresponding with the basic pattern of the transaction presented in figure 3.5.

Figure 3.10 The basic pattern of the transaction represented by a state transition diagram

The current section has introduced a modified form of the traditional State Transition Diagram technique to represent communication processes in general and
the transaction process in particular. This modeling technique provides a tool to represent the structure of action coordinating communication in organizations. The next section elaborates on the meaning and elements of communication acts and transaction states, both constituting the main components of the Transaction Process Model that is developed in section 3.3.3.

3.3.2 The components of the transaction process

A transaction process consists of transaction states, and the acts causing transitions in a transaction process. In the previous paragraph described the symbols for the components of a transaction process, but the notions of communication acts and transaction states have not been considered in detail. The following sections are used to focus in detail on the composition of the communication acts and the transaction states.

3.3.2.1 Communication acts

In a transaction process, communication acts trigger transitions from one transaction state to the next. However, in reality these communication acts are utterances in natural language by the participants engaged in a business transaction. These utterances are composed of elements that can be transformed and identified as elements of a particular transaction process. The action perspective on language divided these elements in two parts; propositions and illocutions. The proposition can be used to determine to what type of transaction process a specific communication act belongs, while the illocution can be used to determine the location of a particular communication act in the transaction process as a whole. In this section I will elaborate on the communication acts and identify their structure in detail.

The internal structure of the communication acts in a transaction process consists of two main components: action-coordinating indicators, and a proposition. On top of these two parts a speaker is identified. The speaker in this constellation is the actor who utters the communication act. In the DEMO approach this is either the initiator or the executor of the transaction process. Since a transaction process involves two actors, it can be one of these two actors that plays the role of the speaker. It has to be noted that an actor denotes a role of a member of the organization and not a particular person. The action-coordinating indicators and the proposition exhibit a more complex structure and are strongly related. Similar to the relation between the illocution and the proposition in Speech Act theory, the action-coordinating indicators determine how the proposition has to be understood by the hearer. On top of this function, the action coordinating indicators indicate the way in which action in the social world is coordinated. This implies that the action coordinating indicators exhibit a more complex structure than just the structure of an illocutionary act, and it is for this reason that I prefer this term above the term illocution. Before defining these indicators in more detail, I first explain the structure of the proposition.
The proposition plays an important role in the transaction. When a transaction process is started the initiator of the transaction utters a communication act composed of an action coordinating indicator and a proposition. In case of a transaction, the proposition specifies the objective action the initiator likes the other actor to perform. This proposition remains the same throughout the entire transaction. This does not imply that there is no discussion about the content of the proposition, and that every proposed future action needs to be accepted once it is proposed. However, changes to the proposition of the transaction result in the initiation of a new transaction process. Thus, in a successful transaction the starting proposition is identical to the final proposition. The procedure of the formulation of a proposition returns when the Transaction Process Model is introduced.

The proposition of the communication act is divided into two main parts: a predication and a time for completion. The predication part contains a description of the negotiated objective act. The form in which the predication part is stated is the *constative* form. Most importantly, this means that the predication part lends itself to a traditional true/false test. Another advantage of the constative formulation of the predication is that it allows a representational or functional decomposition into its constituents. I have illustrated this in section 2.1 of the previous chapter. A constative predication description also lends itself to a representation in first order logic based conceptual models, like, for example, object oriented modeling tools (Rumbaugh, 1991; Embley, et al., 1992), NIAM (Nijssen, Halpin, 1989; Nijssen, 1993) or Entity Relationship models (Chen, 1976; Yourdon 1989). For an overview, see Hofstede (1993). An example of a constative proposition that both allows a true/false test and direct transformation in one of the models mentioned above is:

The order with order# 2385 is delivered by the employee with name J. Slocumb

As long as the order is not delivered, the statement remains false. However, as soon as the customer order is delivered by the employee named J. Slocumb, the predication becomes true, in transaction process terminology, the statement becomes a fact.

The second part of the proposition is the *time for completion*. The time for completion is included for pragmatical reasons. If the same example is considered again, it can be noted that normally we want the order to be delivered before a certain moment in time. Preferably, the delivery date that has been agreed upon in the contract with the customer. So:

The order with order# 2385 is delivered by the employee with name J. Slocumb, before tomorrow (12/05/95) 17:00 hours

would be a useful proposition for a business transaction. The proposition can only become true before the indicated time for completion, after this moment the proposition can never become true again. The incorporation of a time for completion is an essential element of a proposition and a correct reflection of the

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3 The distinction constative/performative was first introduced in Austin (1962). Later on, Austin abandoned this initial distinction. Recently Taylor (1994; 1993) re-examined this distinction and proved it to be of great value for the understanding organizational communication.
daily practice in businesses. A confirmation of this statement can be found in the research conducted by Rehbein (1992) in which he determines the conversation structure of business communication of international contractual negotiations in the European Community.

The second main component that is identified in a communication act is the action coordinating indicator. The basic structure of an action coordinating indicator of a communication act consists of two elements, both establishing the way in which a certain proposition is to be understood by the other actor. The first element of the action coordinating indicator refers to the illocution as identified by the Speech Act theory. According to Searle and Vanderveken (1985) the strongest indicator for the illocution of a speech act can be found in the verb phrase of an utterance. If we for example consider the following utterances:

“I want you to deliver the order this afternoon”

and

“I have delivered the order this afternoon”

it is easy to determine that the first utterance is spoken before the performance of the order delivery action and the second utterance after the completion of the instrumental action. The difference is, however, only located in the verb part of the verb phrase of the two utterances, and especially the verb tense. In the first utterance the present tense refers to future action, while in the second utterance the perfect tense refers to a past event. This insight has led to the attempt to assign verbs and their tenses to the five families of illocutionary forces (Vanderveken, 1990; Janson, Woo, 1992; Bach, Harnish, 1979). Unfortunately, these attempts have not lead to an unambiguous assignment of illocutionary points and forces to individual verbs. Verbs can only be grouped in different classes, when the complete utterance in which they are used is considered. For this reason I propose to use a verb indicating the illocutionary force in combination with the illocutionary class this verb (in this particular utterance) belongs to. So, on the basis of the verb ‘want’ and the direct reference to a preferred executor the action, illocution of the first utterance is characterized as a “Request (Directive)”, and the illocution of the second utterance as “State (Declarative)”. In the previous chapter (section 2.4.1) I have explained that the Speech Act theory alone fails to show how speech acts bring about coordination in the social world. This has led to the introduction of Habermas’ distinction between the strategic and communicative oriented action types. Strategic action is orientated to success, while communicative action is orientated to reaching mutual understanding. In the previous chapter, I have explained the important communication differences that are associated with this distinction. For this reason, the action coordinating indicator extends the verb and the illocutionary class with an action type. These action types are represented by a capital letter. The “S” represents the action type strategic action, the “C” the action type communicative action, and the communication situation in which new background conditions are discussed, the discourse, is represented by a “D”. When the first utterance in the example conversation of the previous paragraph is re-considered (“I want you to deliver the order this morning”),
it becomes apparent how important the determination of the action type is. Depending on the context in which the utterance is uttered one can identify:

- a directive to deliver an order in the afternoon that is open to discussions of all kind (communicative oriented request);
- an imperative to deliver an order that allows no discussions (strategic oriented request);
- a directive that belongs to a discourse in which new general rules for the delivery of orders is being established (discursive oriented request).

A further implication of Habermas' distinction between action types is the identification of validity claims. When uttering a strategic oriented communication act, the speaker raises a claim to power, and when uttering a communicative oriented communication act the speaker raises claims to truth, justice and sincerity. Since the communicative oriented act aims at reaching mutual understanding, the hearer has to agree on all three validity claims raised in the communication act and the speaker is bound to provide an account for each of the validity claims when he is asked for by the hearer. It is, however, only when a discussion about one of the validity claims is started that the claim becomes explicit. This allows a characterization of discussions on the basis of the validity claim that is at stake. For the Transaction Process Model this implies that a change of transaction state can be caused by a discussion about the claim to truth, justice, or sincerity. Because of the nature of strategic oriented communication acts and the fact that in this type of acts only one validity claim is uttered, the power claim is not explicitly represented.

In summary, a communication act is composed of the following elements: a proposition divided into a predication and a time for completion, and an action coordinating indicator composed of an illocutionary class and a verb, and an action type. Figure 3.11 illustrates the composition of communication acts graphically.

```
COMMUNICATION ACT
    proposition
      predication
      time for completion
    action coordinating indicator
      illocutionary class and verb
      action type and possibly validity claims
```

Figure 3.11 The structure of communication acts

For the representation of communication acts in the Transaction Process Model I propose a formula that integrates the identified elements. The proposition with its predication and time for completion in placed at the center of this formula. The understanding of the proposition is guided by the action coordinating indicator, and therefore the action coordinating indicator is placed in front of the proposition.
Since the action type influences the exact interpretation of the verb and the illocutionary class, the action type in front of these elements. When the elements are ordered, the basic formula for the representation of communication acts exhibits the following structure:

actor:action type[verb(Illlocutionary class)<predication, time for completion>]

When one of the validity claims of a communicative oriented communication act is under debate, this is represented by adding the validity claim at stake in subscript to the action type. For example, when there is a discussion about the truth of an utterance this represented as follows:

actor:action type\_\text{true}[\text{verb(Illlocutionary class)<predication, time for completion>}]\]

The rewriting an utterance to the formula for representing communication acts is illustrated with an example in the line of the communication in the order delivery. In the transaction process regarding the order delivery one can imagine the situation in which the employee commits himself to deliver the order 2385 before tomorrow 17.00 hours.

Employee: “I will deliver the order with order\# 2385, before tomorrow (12/05/95) 17.00 hours”

When it is assumed that the utterance is communicative oriented, this example is transformed in the communication act formula as follows:

Employee: C[promise(commissive)<the order with order\# 2385 is delivered, before 12/05/95:17.00>]

The communication act formula allows the transformation of entire transactional conversations, but after a communication act the transaction proceeds to the next transaction state. The next paragraph elaborates on the transaction states in a transaction process.

### 3.3.2.2 Transaction states

There are three types of communication states identified in the transaction processes: an initial state in which the transaction process starts, a final state in which the end, and the remaining states called transaction states. The current paragraph elaborates on the structure of these states in order to determine the composition of the transaction states in the Transaction Process Model.

In the previous section, it was stated that communication acts belonging to one transaction have an identical component, namely the proposition. In the transaction state the same similarity is observed. Transaction states belonging to the same transaction exhibit one identical component, namely the central proposition. This proposition is identical to the proposition of the communication acts. This implies that the proposition of the transaction states has the same components as the proposition expressed in communication acts: a predication, and a time for completion.
In the transaction states of the transaction process model, the central proposition is extended with a status report based on the action coordinating indicators as expressed in the communication act preceding the transaction state. This means, for example, that a transaction state following the communication act:

Employee: C[promise(commissive)<the order with order# 2385 is delivered, before 12/05/95:17.00>]

has the status:

<the order with order# 2385 is delivered, before 12/05/95:17.00>COMMITTED

Based on this assumption, the general structure of a transaction state exhibits the following pattern:

<proposition>STATUS

If the transaction states in the basic pattern of the transaction represented by a state transition diagram (see: figure 3.10) are represented in by this formula, the following states are found (see table 3.2):

<table>
<thead>
<tr>
<th>Previous state</th>
<th>Communication act</th>
<th>Next state</th>
</tr>
</thead>
<tbody>
<tr>
<td>initial state</td>
<td>CA1</td>
<td>&lt;proposition&gt; DIRECTED</td>
</tr>
<tr>
<td>&lt;proposition&gt; DIRECTED</td>
<td>CA2</td>
<td>&lt;proposition&gt; COMMITTED</td>
</tr>
<tr>
<td>&lt;proposition&gt; COMMITTED</td>
<td>OA</td>
<td>&lt;proposition&gt; EXECUTED</td>
</tr>
<tr>
<td>&lt;proposition&gt; EXECUTED</td>
<td>CA3</td>
<td>&lt;proposition&gt; STATED</td>
</tr>
<tr>
<td>&lt;proposition&gt; STATED</td>
<td>CA4</td>
<td>&lt;proposition&gt; ACCEPTED</td>
</tr>
</tbody>
</table>

Table 3.2 Transaction states in the basic pattern of the transaction

In the representation of the transaction process, in figure 3.10, the initial state and final state are represented with different symbols to indicate that they have a special status in the intersubject world. When the table above is examined, it is noted that the initial state has no proposition and no status. This is explained by the idea that the initial state only indicates that there is no previous transaction state and communication act in the same transaction process. The final state indicates that there is no following state. This, however, does not show itself in the elements in transaction state.

I have defined both the communication act and the transaction states, together constituting the main components of the Transaction Process Model. These two elements relate to each other in a particular communication process structure. The model describing this structure is called the Transaction Process Model.

3.3.3 The transaction process model

The Transaction Process Model (TPM) is a model depicting the process structure of communication for the purpose of the coordination of activities in organizations. The graphical representation used for this model is the modified version of the state
transition diagram technique. The TPM incorporates all possible communication 'moves' of the actors engaged in a transaction process. This section firstly presents the TPM for with a communicative oriented transaction process. These transaction processes exhibit the most complex communication structure. On the basis of the theoretical characterization of strategic action, described in chapter 2, the communication process structure of strategic oriented transaction processes is elicited from the communicative oriented TPM.

Earlier in this chapter it was argued that discussions and discourses constitute an integral part of communication in organizations. The TPM, representing the structure of this type of communication, integrates discussions and discourses as layers of the transaction process. Together, three layers are identified. The highest level is called the *success-layer*. This level locates the successful transaction process resulting in the creation of a new fact. This level corresponds with the general structure of a transaction as conceptualized in the DEMO approach. The essence of the middle level is formed by the discussion about validity claims. The middle layer also includes the possibility for transaction process to end unsuccessfully. Therefore this level is called the *discussion and failure-layer*. The lowest level locates the discourse with the purpose to restore the background conditions in the communicative oriented communication. This level is called the *discourse-layer*. The three levels are strongly related. Communication at the discussion-layer can only exist in relation to communication at the success-layer, and communication at the discourse-layer is only possible when there first has been communication at both the transaction and discussion layers. This view is consistent with the philosophy of Habermas.

In the next paragraphs each of the layers is examined in detail, resulting in the complete Transaction Process Model.

### 3.3.3.1 The success-layer

The success-layer of the TPM has already been displayed in section 3.3.1 when I introduced the state transition diagram technique (figure 3.10). The success-layer forms the kernel of the TPM. This layer incorporates the minimal set of communicational moves for the successful completion of a transaction process. The means that it incorporates an actagenic conversation resulting in an agenda, and a factagenic conversation that results in the creation of a fact. The success-layer of the TPM is displayed in figure 3.12.

The success-layer has to be interpreted as follows: A request for some action is uttered by means of CA1, and the transaction reaches the state in which a certain action *and* time for completion becomes REQUESTED. The executor of the transaction commits him/herself to execute the requested action by means of CA2. The action is executed in OA, and the transaction process reaches the state *<proposition>*EXECUTED. When the completion of the action is reported by means of CA3, the initiator of the transaction accepts the completion of the action (CA4), and thereby the transaction reaches its final state, the transaction state in which,
according to the transaction paradigm, the content of the proposition becomes a new fact.

![Diagram](image)

Figure 3.12 The success-layer of the Transaction Process Model

It is important to emphasize that all the communication acts and transaction states are necessary for the creation of a fact. In other words, skipping one of the states or acts at the transaction level results in an incomplete, and thus unsuccessful transaction.

### 3.3.3.2 The discussion and failure-layer

When the communication in an organization is observed, many discussion-like conversations are observed. Earlier in this chapter it was argued that more discussions are expected to be observed in organic organizational forms than in mechanic forms. The examination of Habermas’ theory of Communicative Action revealed that many of these discussions fit with the basic aim of communicative action, namely that the participants are trying to achieve a common definition of the situation in which they find themselves. In transactional terms, the participants in a communicative oriented transaction process discuss whether the claims incorporated in a communication act and lay down in a transaction state are true, justifiable, and truthful. This contesting of the validity claims raised in every communication act enables the participants to reach the desired common definition which is necessary for communicative oriented coordination of action in the social world.

Since discussions are normal phenomena in organizations, a transaction process model, claiming to present the complete structure of action coordinating communication in organizations, needs to incorporate a discussion structure. The discussion structure is represented in the second layer of the TPM, the discussion-layer. A requirement for the incorporation of a discussion-layer in the TPM is that the discussion layer may not prevent the transaction process proceeding through all the communication acts and transaction states at the success-layer of the model, since a transaction can only become successful when transaction proceeds through the minimal set of acts and states postulated in the success-layer.

According Habermas’ theory, discussions are centered around the validity claims to truth, justice and sincerity. Habermas then distinguishes three categories of discussions each based on one of the three claims. For the actogenic conversation part of the transaction process this means that once the first communication act is uttered and the transaction status DIRECTED is reached, the executor can contest, by means of a discussion, each of the validity claims raised in the communication act and laid down in the transaction state. The initiator is then bound to provide an account for the contested validity claim. In the TPM the possible discussions are represented as the communication act CA5 from transaction state 1 (DIRECTED) to 6
where the executor demands the initiator of the transaction to justify one of the three validity claims. The justification is provided in CA6 (see figure 3.13). The validity claim that is under debate in the discussion can be recognized by the subscript attached to the action type indicator of the communication act CA5. If the executor accepts the justification, the transaction process can proceed to the transaction state in which the executor commits him/herself to perform the action, and thereby creates the agenda of the transaction.

A different situation emerges when the executor does not agree with the validity claims raised. When this happens during the discussion, this can result in desired changes to the proposition. It was stated earlier that the proposition in a transaction has to remain the same throughout the entire transaction process. For reasons of classifying communication acts into a particular transaction, I consider this proposition consistency to be important. For the TPM this implies that changes to the proposition are incorporated in a transaction by means of a new request. This point is illustrated with the same example that was used before. If the employee is asked to deliver a certain order before the end of the day, he may want to do it, but at the same time he cannot because his van is already packed. Note that the employee is in principle willing to deliver the order, but he is constrained by an external limitation. Given this situation, the following exchange of four communication acts could be observed as a follow up to the request to deliver the order today (the communication acts are numbered in order of appearance):

CA1  Employee: "Today will not be possible anymore, the van is packed with orders for today."

CA2  Foreman: "I understand. It would have pleased Mr. Do very much if you could have delivered it today."

CA3  Employee: "Do you want me to deliver it tomorrow?"

CA4  Foreman: "Yes, can you deliver the order for Mr. Do tomorrow morning before 12 o'clock?"

In this example we observe in communication act CA1 that the employee, who is the executor of the transaction, states that today (with emphasis) the delivery is not possible. By emphasizing 'today' the employee shows that he would have liked to deliver the order, and that he likes to discuss another solution. The validity claim at stake is the claim to truth, this can be derived from the second part of the communication act where the employee relates the request to a situation in the objective world; the world truth relates to. The foreman respects the employee's objections, but also adds a justification by asking for a special treatment of the order. In communication act CA3 the employee invites the foreman to rephrase his request into a new request, which the foreman does in CA4. This fragment is an illustration of how a transaction process proceeds when the proposition of a request is changed as a result of a discussion in the discussion-layer of the TPM.

A result of a discussion, as the one above (but also of a sole request), may be that the executor declines to perform the requested action. In chapter 2 this situation was called a definite disagreement. The personal reasons for this disagreement and the
decision to decline are not important. The refusal to perform an action is expressed by means of CA8 in the TPM, and on the basis of the transaction state in which the action is declined (7), the initiator cancels the action (CA9). As a result the transaction reaches the final transaction state (8). This final state is not one of success, but one of failure. There is no fact created or it must be the fact that the transaction has ended unsuccessfully. The two steps involved in the cancellation of a transaction process may look redundant, however, a transaction process can only be canceled by the initiator. If the TPM would not comply with this rule, it would break with the underlying notion of the cyclic communication process.

The last communication act that can be identified in the actagenic conversation of the transaction is an initiator initiated cancellation that occurs during the discussion about one of the validity claims. A cancellation of the transaction process of this type is performed by the initiator when he has the idea that a discussion will not solve the disagreement. The transaction process then proceeds by means of communication act CA10 to the final transaction state 8.

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**Figure 3.13** The success-layer and the discussion-layer of the Transaction Process Model

Although the executor commits himself to the execution of some action in the actagenic conversation, the execution of the objective action may stagnate because of unexpected and unforeseen reasons. After all, a decision to commit oneself to the execution of an objective action is taken under conditions of bounded rationality. One of the reasons to decline the execution of the action that can be observed in our delivery example, is that the van by which the orders are delivered breaks down. The result of this break down is that the executor cannot perform the delivery he has committed himself to. The employee will then have to decline the execution of the action. In the TPM this possibility is included by means of the communication act CA17, where the executor of the action states that he cannot complete the action to which he committed himself. Like the other situation in where the executor declines to execute the action as requested by the initiator, the initiator continues by canceling the action (CA9).

In the factagenic part of the communicative oriented transaction similar communication steps take place. However, the communication steps in the
factagenic conversation are not identical to the steps in the actagenic conversation. In the factagenic conversation the discussion is started by the initiator of the transaction and concerns the result of the actual execution of the action as stated in the central proposition of the transaction. After the execution of the action the executor states the completion of the action by means of CA3 resulting in the transaction state <proposition>STATED. This state can form the starting point for a discussion about one of the three validity claims raised in the communication act CA3, or a decline of the result of the action. Normally, discussion in the factagenic part of the transaction process are observed when the result of the execution of an objective action does not harmonize with the expected results. For example, a customer asks to deliver a certain product and this product has been changed due to some product innovations, he may ask whether the delivered goods are the same as the requested goods. Similar situations are often observed in business organizations. As a result, the customer may also decide not to buy the changed product, and cancels the transaction.

A last communication step that can emerge in the factagenic conversation is that the initiator of the transaction requests the executor to redo the execution of the action. In this redo situation the result of the action does not harmonize with the requested action and the initiator believes (or knows) that the execution can possibly lead to the desired result. This communication step is integrated in the TPM as CA16 from transaction state 4 back to state 2. In all other situations the transaction process proceeds to state 5 where a (new) fact is created.

The discussion and failure-layer of the TPM relates to discussions and failures of individual transaction processes. However, in some situations a discussion relates to the background conditions of a group of related transaction processes. These discussions, called discourses, are dealt with in the discourse-layer that is presented in the next paragraph.

3.3.3.3 The discourse-layer

When the communication in an organization is observed, one can observe the uncomplicated transaction processes and possible discussions about validity claims that take place, but one can also observe a type of discussions that establishes new (organizational) rules. In the discussion of the five types of organizational communication, this type was labeled as precondition creating communication. Discussions of this last type take place in scheduled as well as in ad hoc meetings, and form an alternative for a transaction process that is heading for a definite disagreement and cancellation. These discussions, called discourses, exhibit a special characteristic that enables to distinguish them from discussions about validity claims. Discussions about validity claims, like transaction processes at the success-layer, are concerned with one specific action, as communicated by the initial communication act of the transaction process. Discourses, on the other hand, relate to all previous and future transactions of the same type. By means of a discourse the participants try to establish, under the strict condition that only the better argument may prevail, (new) rules for a particular transaction type. The rules
that are the result of a discourse are based on transactions of the same type and form a background condition for the future execution of transactions of this same type.

The rules that are the result of a discourse are comparable to the types of social norms distinguished by Liu (1993; see also: section 2.3). A discourse is started because there exists some degree of dissatisfaction or unfamiliarity of the participants engaged in a transaction process with an underlying norm that serves as a background condition. When this dissatisfaction of unfamiliarity manifests itself in a discussion about one of the validity claims, this discussion can be interpreted as a discussion about the discrepancy that exists between the norms as used by each of the parties involved in the transaction. When this discrepancy cannot be resolved, or occurs very often in transactions of the same type, a discourse is initiated about the norm underlying the disagreement. At this point, the participants suspend their immediate objectives and focus on the underlying norm in general. By means of a discourse an implicit-informal norm becomes an explicit-informal norm, and an explicit-informal norm becomes an explicit-formal norm. This alteration of norms by means of discourse in the norms pyramid is displayed in figure 3.14. At the same moment, formal-explicit norms form the backing in discourses on informal-explicit norms, and informal-explicit norms form the backing in discourses on informal-implicit norms. In discourses on formal-explicit norms other formal explicit norms are used to re-evaluate.

![Diagram of Norms Pyramid](image)

Figure 3.14 Norms pyramid displaying the alteration of norms by means of a discourse

In the TPM the initiation of a discourse is divided into an actagenic and a factagenic discourse each starting from a discussion about validity claims. In the actagenic conversation, the initiator of a transaction process may request a discourse by means of CA18 from transaction state 6 to 11 (see: figure 3.15). With CA18 the initiator requests a discourse on the general justness of the norm that is under debate in the discussion about validity claims (the discussion and failure-layer). When the justness of the norm is discussed, the participants will continue the transaction process they have temporarily suspended. This leads to a request started from the discourse state 11 by means of communication act CA20. A discourse may also be requested by the executor after a discussion about validity claims. This is performed by CA19 from transaction state 1 to 11. In the factagenic conversation a discourse can be requested by the executor of the transaction, for example when the executor
disagrees on quality standards that are presupposed by the initiator of the transaction. The discourse is started with CA21 and with the (new) norm in the back of his mind, the executor re-declares the completion of the execution of the action (CA23). The initiator can start a discourse by means of CA22.

Figure 3.15 The three layers of the communicative oriented Transaction Process Model

In the TPM discourses are represented as black boxes (Dietz, 1987), both the communication acts that start a discourse, and the communication acts that are the result of the discourse are included, while the communication steps that take place during the discourse are not explicated. The reason for this representation lies in the difference in nature of the discourse-layer, compared to the two other layers. The upper layers of the TPM focus on propositions and action coordinating indicators related to individual transactions, while the discourse focuses on norms underlying types of transactions. In this respect the discourse-layer can be seen as an abstraction of the other layers. However, it would be a mistake to exclude discourse from the TPM as they form a possible, and necessary extension to communicative oriented transaction processes.

When the black box is opened and the state transition diagram technique for communication modeling is used to represent the internal structure of a discourse, a simple communication structure appears (see: figure 3.16). A norm is stated, questioned and justified until there is an agreement (state 2). Since the object of the discourse is a norm, this means that the arrows do not represent communication acts. The transitions in the process model of a discourse are caused by Discourse Acts (DA’s). Based on the structure of communication acts and the structure of claims as described in section 2.4.2.1, discourse acts exhibit the following structure:

```
action type[verb(ilocutionary class)<(counter-
    argument(qualifier)), norm>]
```

The discourse process model has to be understood as follows. By means of DA1, a norm is introduced as the subject of the discourse and the discourse reaches the
state ≪(counter-argument(qualifier)),norm≫STATED. With discourse act DA2, a norm is accepted as the new background condition for a specific type of transaction. DA3 and DA4, represent the discussion about the justness of all the variables in a particular norm. This discussion may focus on the data, the warrant, rebuttal, the modal qualifier and the backing of a norm.

Figure 3.16 The communication structure of a discourse

Not all transaction processes in an organization have a communicative orientation. In the next paragraph the structure of transaction process with a strategic orientation are examined.

3.3.3.4 The strategic oriented transaction

Strategic action distinguishes itself from communicative action in the fact that there is a claim to power involved, and that the participants are oriented to success. In chapter 2, it was explained that in strategic oriented action the communication structure is characterized by ‘yes’, ‘no’, while in communicative action this structure is characterized by ‘yes’, ‘no’, and ‘yes, but ...’. It can be said that communicative action exhibits a trichotomic communication structure while strategic action has a dichotomic structure (Reijswoud, 1993).

When the TPM of the strategic oriented transaction process is presented on the basis of the dichotomic / trichotomic distinction, a stripped version of the communicative oriented TPM appears. The possibility for starting a discussion about validity claims in both the actagenic and factagenic conversations as well as the option to start a discourse are deleted, since both are discussions meant for achieving mutual agreement; the basic orientation of communicative action. The TPM for strategic action based on a ‘yes’ and ‘no’ communication alternative is depicted in figure 3.17.

In some situations the strategic oriented transaction process and the communicative oriented transaction process are related to each other. The communicative oriented transaction process forms a starting point for the initiation of a strategic oriented transaction process, and the other way round. Here it concerns an initiator initiated change of the action type of a transaction, while the proposition of the transaction stays identical. The initiator can have various personal reasons for this action type change. The executor does not have this possibility. The initiator of a communicative oriented transaction may desire to change the action type of the transaction when he feels that the transaction is heading for an unsuccessful end. If
there exists a hierarchical relation between the initiator and the executor of a transaction, an action type change of this kind is allowed. The initiator can force the executor to perform an action by initiating a strategic oriented transaction. An action type change from a strategic to a communicative oriented transaction process is allowed in all situations. Every initiator that can start a strategic oriented transaction process can, in principle, start a communicative oriented transaction process.

Figure 3.17 The TPM of the strategic oriented transaction

Changes of action type can be started from all the transaction states from which the initiator starts a transition to a next transaction state. This means that a change of action type can be started from transaction states 4, 6, 7 and 10 in communicative oriented transaction and states 4 and 7 of the strategic oriented transaction. After a change of action type, the transaction reaches state 1 of the communicative or strategic oriented transaction.

3.4 Conclusions

The current chapter has presented a detailed representation of the structure of action coordinating communication in organizations. The Transaction Process Model, in which this structure is represented, establishes the conclusion of the theoretical examination that was started in chapter 2. The first step formed the examination of communication and its action coordinating nature. The examination resulted in a theory of communication defined in three interrelated parts: language, the communication process, and coordination. In the current chapter the scope of this theory of communication was narrowed to organizational communication.

To establish the relation between communication and organization, Taylor’s definition of organization as the communication mediated coordination of the efforts of people working on activities, together establishing a collaborative task was adopted as starting point. Communication in organizations was divided into 5 categories; action initiating, action reporting, information providing, precondition creating, and informal communication. The first two categories are directly involved in the coordination of the efforts of people in an organization. They are
supplemented by information providing and precondition creating communication. I have excluded informal communication, not because I do not consider it to be important, but to limit the research. On the basis of the categories of communication, theories on organizational behavior and Habermas' theory of Communicative Action, it was argued that organizations can be characterized by the communication that is used. Organic or emergent organizational forms exhibit a large volume of communicative oriented communication. Contrary to mechanistic or classical organizational forms, in which the efforts of the workers are predominantly coordinated by strategic oriented communication.

On the basis of the examination of three approaches for modeling organizational communication I have adopted the DEMO transaction pattern of communication and action as the most useful conceptualization of communication mediated coordination of efforts in an organization. Together with the result of the theory of communication, the transaction pattern forms the basis for the TPM. This model is a communication process structure model of the action coordinating communication performed in transaction processes. These transaction processes are considered to establish the backbone of organizations.

In the course of the research I will examine two possible application areas of the TPM; the design of Computer Mediated Communication Systems (CMCS's), and the optimization of business processes (Business Process Redesign/Reengineering, Total Quality Management). The TPM describes the possible behavioral moves that can occur during action coordinating communication in organizations, as well as the minimal set by which this type of communication in organizations has to take place. This can provide guidelines for the requirements determination for CMCS. The design of a system supporting business communication needs to be founded in the structure of the TPM. If the underlying communication structure model of a CMCS does not adapt to the structure of human communication, it is not longer supporting it, but is obstructing it. Next to this application area, the TPM can be used as an analysis tool for the identification of efficient and inefficient forms of business communication. As a general rule it can be stated that inefficient business transactions are characterized by many communication acts while efficient business communication limits the amount of communication acts to the possible minimum. This possible minimum consists of the communication acts located at the success-layer of TPM. The application areas of the TPM are examined in detail in chapters 6 and 7.

Before these application areas are examined in relation to the TPM, the next part of the dissertation reports on the application of the model for the understanding of the structure of communication in two organizations. Because the TPM is partially based on the DEMO transaction paradigm, this approach is used for the identification of, so-called, transactional communication in organizations. It can be said that the TPM provides an extension to the DEMO approach that allows a better understanding of this form of communication.

The aim of the following two chapters of the dissertation is to establish an empirical justification between the theoretical TPM and the daily practice of communication.
in organizations. The communication that is identified with the DEMO approach is analyzed with the TPM in order to determine its structure. This means in the first place that the communication will have to be expressed in the formulae of communication acts, and in the second place that the relationships between the communication acts is to be expressed in the communication process structure of the TPM. An important question that is to be answered in this part of the dissertation is whether the TPM allows the representation and understanding of the communication that is encountered in these studies. In other words, is it possible to express all utterances, involved in a transaction process, in the TPM?
PART II

PRACTICE
Field Study 1
The Scheduling Office

The purpose of the first part of the research was to obtain an understanding of communication in general and with particular focus on organizational communication. This has resulted in a three layered theory of communication and a model of business communication. In the second part of the research the focus shifts to a practical application of this theoretical understanding. Firstly, a way to analyze business communication is presented by means of two field studies. Both field studies illustrate how an analysis of business communication with the DEMO approach is extended with the analysis of communication with the Transaction Process Model (chapters 4 and 5). Then, it is illustrated how the TPM is used to optimize business communication (chapter 6). Finally, it is argued that the TPM is a valuable tool for the design of Computer Mediated Communication Systems (chapter 7).

In the next two chapters I report on the analysis of organizational communication in two field studies. The first field study is performed at the scheduling department of the Faculty of Economics at the University of Limburg, and the second field study was performed at the Profiles Company, an aluminum window frame producing company. The analysis of the communication in the two field studies is performed in two steps. First the organizations were analyzed with the modeling tools provided by the DEMO approach. By means of these tools it is possible to achieve a solid understanding of the types of transactions that take place in an organization, the
participants involved in these transaction types, the information that is needed and
created in these transactions, and the relationships between the different transaction
types. The resulting DEMO analysis forms the necessary background for the
application of the TPM. The second step in the analysis of the field studies involved
a detailed examination of the communication that establishes a particular
transaction type in DEMO. Recorded conversations establishing a transaction type
were parsed on the structure of the TPM.

The aim of the current chapter is to establish an empirical justification between the
theoretical TPM and the daily communication practice in organizations by means of
the field studies. This means that it must be possible to express the actual
communication, as it takes place between the members in these two organizations,
in the structure of the TPM in such a manner that it complies with the
communication theory on which the TPM is based.

The current chapter proceeds from theory to practice. Section 4.1 elaborates on the
theoretical characteristics of the DEMO modeling tools that are considered
necessary for the understanding of an organization as a network of transactions. The
section also introduces the graphical representations that are proposed for the
modeling of this transaction network. As a conclusion the section explains the
relationship between DEMO and the TPM, and demonstrates how communication
can be parsed onto the TPM in order to create a Transaction Process Diagram of a
particular transaction process. Sections 4.2 reports on the first field study. After a
short description of the study, it is firstly analyzed with DEMO, and then the focus
shifts to the actual communication and the TPM. The chapter is concluded with an
evaluation of the results of the analysis.

4.1 Modeling with DEMO

In section 3.2.3 of the previous chapter, the basic philosophy underlying the DEMO
approach was introduced. Since the main focus of that section was on the
theoretical evaluation of the DEMO transaction concept, I have only briefly
mentioned the tools by which dynamics of an organization, located in the carrying
through of transactions, are modeled. In the current chapter, where the detection
and analysis of communication forms the central theme, these tools become
important. Therefore this section elaborates on the modeling tools provided by
DEMO.

DEMO is a transaction oriented organizational modeling approach. Central to this
approach is the idea that the behavior of a business (or any organization) consists of
the carrying through of transactions. Every objective action is embedded in a
transaction and every established fact is the result of the successful carrying through
of a transaction. This constitutes the, so-called, DEMO transaction paradigm. The
modeling tools in DEMO aim at providing a detailed account of transaction types
and their mutual relationships, together establishing the core of a business or
organization.

The modeling tools are an integrated whole of four interrelated partial models: the
communication model, the process model, the action model and the facts model
(see figure 4.1). The communication model (CM) is the central model in DEMO. This model consists of the specification of the transaction types together with their initiating and executing actors. The CM describes the intersubject world. The object world (or the things the actors communicate about) is defined in the facts model (FM), while the behavior of an actor is described in the action model (AM) by means of a procedural language. Finally, the process model (PM) describes the time relationship between the different transaction types constituting the core of the organization.

At any moment in time there is only one CM, one FM, one AM, and one PM of an organization, but the same CM allows more than one PM, AM or FM. This property of the model is the basis for organizational (re)design. In the chapter 7, I will elaborate in more detail on this feature of the DEMO approach. In figure 4.1, this property is represented by the double arrows between the CM and the other models. The figure also shows that there is always only one CM.

![Diagram of the four basic models in DEMO](image)

Figure 4.1 The four basic models in DEMO

Because of its specific transaction orientation, the meaning of the models used does not correspond with other models known in the informatics area. Therefore, each of the four basic models in the DEMO approach is supported by its own graphical representation. In the remaining part of this section I elaborate on the CM, PM, and FM and their graphical representations, because the models are used to analyze and describe the two field studies. The AM of the field study is not considered because my aim is not to describe the actor-related mental behavior rules regarding the business process, but the observable communication process.

### 4.1.1 The DEMO Communication model

The *Communication Model* (CM) of an organization is the specification of the interaction structure and the interstriction structure between actors. By *interaction* structure it is understood to be the mutual influencing through being initiator or executor of transactions. By *interstriction* structure it is understood to be the mutual influencing by means of created facts that play a role in the condition part of the behavioral rules that are executed in carrying through transactions. An example of interaction is the delivery of some goods x by a manufacturer after a request of a customer. An example of interstriction is the checking of the manufacturer whether
the requested goods x are in stock or need to be produced. This checking plays an important role in the interaction between the two parties, because the availability of the goods may determine the time of delivery.

A CM is graphically represented by means of a Communication Diagram (CD). In the communication diagram, an actor is represented by a box. A transaction type is represented by a disk. The operational interpretation of a disk is a store for the statuses through which the transactions of that type pass in the course of time. Because of the transient character of this information, the disk symbol is called a transaction channel. The facts that are created as a result of the successful carrying through of a transaction, are considered to be represented by true propositions stored in a fact bank. A bank is represented by a diamond. To show that the facts are the result of carrying through transactions of a particular type, the diamond symbol is drawn 'behind' the disk symbol of the transaction type. The combined symbol of a transaction channel and its corresponding fact bank is suited to represent internal fact types and boundary fact types. However, the actors in the system may also need to know external facts, i.e. facts created outside the system. The combined symbol is too specific to represent the external fact types, because the corresponding transaction types fall outside the scope of interest: they are thus not known. Therefore, the external fact types are arbitrarily put together in external banks, which are represented only by the diamond symbol. The actor who is the initiator of a transaction type is connected to the transaction channel by an initiator link. This is represented by a plain line. The actor who is the executor of a transaction type is connected to the transaction channel by an executor link. This is represented by a plain line with an arrow head at the side of the actor box, pointing to that box.

![Diagram](image)

Figure 4.2 Possible syntactic constructions in a Communication Diagram

Interstriction is represented by data links (dotted lines) between actors on the one side and fact banks and transaction channels on the other side. Figure 4.2 shows possible syntactic constructions in a CD and figure 4.3 provides a legend of the meaning of the used symbols.
Figure 4.3 Legend of the Communication Diagram

The gray-colored rectangle represents the system boundary. The actors A0.1 and A0.2 are external actors, while the actors A1.1, A1.2 and A1.3 are internal actors. The transaction types T1 and T2 are boundary transaction types, while the transaction types T3 and T4 are internal transaction types. The bank E1 is an external bank.

The external actor A0.1 is the initiator of transaction type T1; the internal actor A1.1 is the executor of this transaction type. In executing the transactions of this type, and in carrying through the performative conversations, actor A1.1 uses data from the external bank E1. As a result of the execution of a transaction, it declares the existence of one or more facts, which are stored in the bank of T1, and it initiates a transaction of type T4. Actor A1.3 is the executor of this transaction. In executing the transactions of type T4 and in carrying through the performative conversations, it uses data from the channel of transaction type T3 (transaction statuses). This transaction type has the same actor (A1.2) as initiator and as executor. This is called self-activation of actor A1.2 (Note. This is the way to model periodic activities). In executing the transactions of this type and in carrying through the performative conversations, actor A1.2 uses elements of the contents of the bank of T1 and the channel of T4 as data. As a result of the execution of a transaction, it initiates a transaction of type T2. The executor of this transaction type is the external actor A0.2.

4.1.2 The DEMO Process model

The Process Model (PM) depicts the relationship in time between the different transaction types as identified in the CM, and that together constitutes the business process. The process model is a necessary extension of the ‘timeless’ CM (Reijswoud, Rijst, 1995a). The graphical representation used for the process model is the Action Sequence Diagram (ASD). With the term ‘action’ in the context of the ASD, it refers to a whole transaction or one of the phases in the transaction. In the ASD only transactions or phases of transactions and their relationships are represented. Actors (initiators or executors) are not included in the ASD.

As illustrated in the previous chapter, a transaction is divided into three phases: the inception phase, consisting of the actogenic conversation; the action phase, consisting of the execution of the objective action; and the conclusion phase, consisting of the factogenic conversation. A transaction, as a whole or one of the three element phases of a transaction, is represented by a (stretched out) disk. In the disk the code and the name of the transaction type and transaction phase is
displayed. The code consists of the code of the transaction type, $T_{1...n}$, completed with the capitals "O", "E", or "R", which refers to transaction phases "Order" for the inception phase, "Execution" for the action phase, and "Result" for the conclusion phase. The code of the transaction and the capitals referring to the transaction phases are separated by slash "/". A small disk is used as a starting symbol of a transaction. The small disk may point at a transaction that is initiated by an actor outside the system boundary.

Three different types of arrows are introduced to represent the relationships between the different transactions and transaction phases in the business process. A solid arrow between two disks in the ASD indicates that the action mentioned in the last disk is initiated by the completion of the action in the first disk. In other words, the completion of the first action results in the start of the second action. When the second action is optional to the first action, this is expressed in the ASD by a tiny line at right angles to the solid arrow. When a certain action forms a necessary condition for the start of the next action, this is expressed by a dotted arrow in the ASD. Figure 4.4 shows possible syntactic constructions in an Action Sequence Diagram. (The names of the transactions have not been added in this case, because the diagram is only used to illustrate possible syntactic constructions).

![Figure 4.4 Possible syntactic constructions in an Action Sequence Diagram](image)

Figure 4.4 has to be read as follows. The order phase of the transaction $T1$ is activated by some transaction in the environment of the business process under study. From transaction phase $T1/O$ the optional action $T2/O$ may be started. When transaction $T2$ is started from $T1/O$, it also allows the start of $T3$ from that transaction phase $T2/E$. Once started, $T3$ forms a condition for the completion of $T2/E$ (and thus $T2$ as a whole), and $T2/R$ forms a condition for the completion of $T1/O$. The completion of $T1/O$ results in the start of $T1/E$. Before $T1/E$ can be completed and the transaction proceeds to $T1/R$, $T4$ has to be completed. Figure 4.5 summarizes the symbols and their meaning in the ASD.

![Figure 4.5 Legend of the Action Sequence Diagram](image)
4.1.3 The DEMO Facts model

The Facts Model (FM) presents a conceptual model of the objects which the actors of an organization communicate about (the object world). The model is basically the specification of a first order sorted logic language. Instead of the conventional Peano-Russell notation, the Facts Diagram (FD) utilizes a graphical notation which corresponds to a large extent to the NIAM diagram as described in Nijssen and Halpin (1989), and Nijssen (1993).

The FM considers the object world at a particular moment in time as a static set of facts. The information in the FM is defined in the form of elementary sentences consisting of a predicate and one or more referents. The predicates are called fact types. They may be of any arity and are identified by both a fact type number (FT1,...,n) and a predicate name. In the FD, the fact type is depicted as a sequence of adjacent rectangles, as many as the arity of the fact type. Referents are the objects in the object world. These objects may be material or socially constructed of nature and belong to a certain class of objects. In the FD these object classes are represented by circles or ellipses. To specify a specific property of an object class, a name class is identified next to the object class. The objects can play different roles in a fact. In FD these roles are indicated by numbers in the rectangles, and an object class is linked to the role to indicate the domain. The role numbers that are used relate to only one fact type and are thus relative role numbers. The meaning of the fact type can be determined from the verb phrase that is placed under the rectangles. To assure that the meaning of the fact type is interpreted correctly, the noun phrase is added in the form of the role numbers in brackets (<n>) that correspond to the object classes.

To illustrate the concepts used in the FM, consider the following fact:

The employee with name Slocomb, J. has delivered the order with order number 3568

The fact is composed of the following concepts:

<table>
<thead>
<tr>
<th>Object class:</th>
<th>employee</th>
<th>order</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name class:</td>
<td>name</td>
<td>order number</td>
</tr>
<tr>
<td>Role:</td>
<td>...has delivered...</td>
<td>...is delivered by...</td>
</tr>
<tr>
<td>Object:</td>
<td>Slocomb, J.</td>
<td>3568</td>
</tr>
</tbody>
</table>

In the FD the fact is represented as follows:

![Diagram](image)

Figure 4.6 An example of a fact Ft1 represented in the FD
The object world is not only a set of facts, but it also contains restrictions on these facts. In the FM these restrictions are called constraints. For the purpose of the design of data bases the NIAM approach distinguishes many different constraints, but in the FD only a limited number of basic constraints are identified. The most frequently occurring constraint is the uniqueness constraint. This constraint applies to the role and prescribes that no duplicates are allowed in the objects appearing under the role. When the uniqueness constraint applies to more than one role, this means that the combination of objects may only appear once. In the FD the uniqueness constraint is represented by a line above the role(s). In figure 4.6 there is a uniqueness constraint above role 2. This implies that a particular order# may only appear once in the extension of role 2. When there is no uniqueness constraint placed above a fact type, this implies that the combination of roles may not appear more than once as objects under the role.

Constraints may also apply to a combination of roles belonging to different fact types. These constraints are called inter-fact type-constraints. In the course of this chapter and the chapter, three inter-fact type-constraints are identified: equality, exclusion and subset constraints.

1. The equality constraint between roles 1 and 2 implies that if there exists an object that plays role 1, then the object also plays role 2.

2. The exclusion constraint between roles 1 and 2 implies that there exists no object that is allowed to play both roles 1 and 2.

3. The subset constraint between roles 1 and 2 implies that if there exists an object in 2, then this object exists also in 1.

A different type of constraint is the value rule. This rule specifies the objects that are considered elements of a specific object class. Therefore the value rule appears next to the circle of the object class. E.g., the value rule that applies to the objects in object class “Group” implies that only the groups from 1 to 15 and 32 to 48 are allowed (see figure 4.7).

![Figure 4.7 An example of a value rule on the object class “group”](image-url)
A complete overview of possible constraints on facts in the object world can be found in Nijssen and Halpin (1989), and Nijssen (1993), while more details on the constraints used for the modeling of the object world in the DEMO approach can be found in Dietz (1992).

4.1.4 Extending the DEMO analysis with the TPM

The analysis of an organization or with DEMO and its modeling tools is a way to model the communication network at a high level, at the same time however, it hides the individual communication processes constituting transaction types. In the previous sections I have described how a DEMO analysis results in a model of the communication network in an organization, expressed in actors, transaction types, facts and relationships. To obtain these models, the DEMO approach abstracts from the individual transactions; the instantiated transaction processes. The current section explains how the TPM is used, in addition to the foundation laid by DEMO, to analyze and model individual transaction processes.

There exists an important difference between the models resulting from a DEMO analysis and the TPM. According to Dietz (1987) DEMO models are defined as conceptual models from real systems. The real system is the organization and its behavior, and the conceptualization of this real system into a system of concepts and notions results in a conceptual model. The TPM, on the other hand, is an empirical model. The model is considered to be a scale model of the communication process in the real business system.

The difference between the DEMO models and the TPM is also explained by the purpose of the models. DEMO models aim at providing a detailed account of the different activities in an organization, or business system. The detailed account is achieved by breaking down the whole of organizational activities into smaller constituent parts. This information is obtained by viewing the organization from a observer perspective. The observer perspective allows the analysis to go beyond the field of vision of the individual, and therewith allows the recognition and description of the structural and functional coherence of a particular situation (Korthals, 1989). Within Hirschheim’s two perspectives the DEMO models are considered to be part of the analytical perspective (see section 1.1). The TPM aims at providing a detailed understanding of the action coordinating nature of organizational communication. This information is obtained from an analysis of organizational communication from a participant perspective; only by participating the analysis is able to understand and describe the nature and symbolic meaning of communication in a particular situation (Korthals, 1989). In Hirschheim’s terminology, the TPM is considered to be a representative of the interpretivist perspective.

In spite of the different scope of the models, there also exist a strong supplemental relationship between the TPM, the communication model and the facts model. The transaction types that are identified in the DEMO communication model cover up at least one transaction process of the specified transaction type. The individual transaction processes that are covered up by a transaction type, develop, in some
way or the other, along the lines of the communication behavior as depicted in the TPM. The central theme of these transaction processes is identified in the transaction types of the CM. A business transaction aims at the creation of a new fact. The DEMO facts model describes a conceptual model of these facts. The results of individual transaction processes are added as extensions to the fact types in the FD. Therewith the FM provides a precise understanding of the elements in the proposition of a transaction.

It is hypothesized that every individual transaction process can be represented in a transaction process diagram (TPD). A TPD is an instantiation of the TPM; it is constructed on the basis of an actual communicated transaction process in a business situation, and depicts only the communication steps involved in that particular transaction process. Contrary to the TPM that describes all the possible and allowed communication steps in transaction processes in general. In order to construct a TPD, an observed conversation is first divided into communication acts. Each of the communication acts is numbered \((CA_1, \ldots, n)\). The criterion used to divide a conversation in communication acts is turn-taking (see Levinson, 1983; Taylor, Cameron, 1987). After analyzing the elements of the communication acts, the coherence between the acts is expressed by means of a TPD. To illustrate the way the research data was handled, the following example is analyzed. The communication has already been divided into CA’s (CA1-CA8) on the basis of turn-taking.

CA1  Foreman:  “Sam, can you deliver an extra order this afternoon?”
CA2  Employee:  “Sorry, what order do you mean?”
CA3  Foreman:  “I mean the order over there; the order for Mr. DoDo”
CA4  Employee:  “I can’t deliver it this afternoon unless I leave another order behind.”
CA5  Foreman:  “I understand. You can leave behind Mr. Gilbert’s order and deliver that tomorrow morning.”
CA6  Employee:  “OK, you can tell Mr. DoDo that I will deliver the order by the end of the afternoon.”
<next day>
CA7  Employee:  “I had to hurry, but I delivered the order at 5.30 PM at DoDo Engineering Works.”
CA8  Foreman:  “Excellent!”

The first step is the determination of the structure of the individual CA’s. A way to do this is to rewrite the CA’s with the Moutaouakil notation as described in the functional perspective. When this notation is used CA1 is transformed as follows:

\[
[REQ] E;[order is delivered this afternoon](E)
\]

The method as described by Moutaouakil provides good guidelines for the identification of the proposition and the illocutionary point in an utterance. However, more detail is necessary, and the notation for CA’s, as presented in the previous chapter, is used. In CA1 the foreman requests the employee to perform the
delivery of some kind of order. The request is a polite request and points at a communicative oriented transaction process. When this CA is transformed in the notation for communication acts its internal structure becomes clear.

Foreman: \( C[ \text{request action(directive)} < \text{order is delivered, this afternoon}>] \)

The communication act transformation reveals the reason of the next CA by the employee. The predication of the CA is vague in the sense that there is no specific order specified. Therefore the employee requests the foreman to rephrase the request for action with regard to the order. After the order for Mr. DoDo is specified in CA3, the employee replies that he cannot deliver the order unless he leaves another order behind. This CA is transformed in the notation for communication acts as follows:

Employee: \( C_{\text{truth}} [ \text{counter(assertive)} < \text{order for Mr. DoDo is delivered, this afternoon}> ] \) Reason: truck is full

In CA5 the foreman accepts the contesting of the truth claim of his request, and offers an alternative. The alternative seems to be acceptable for the employee because in CA6 he promises to perform the requested action; the delivery of the order that same afternoon. In the course of the next day the remaining part of the transaction process is observed. In CA7 the employee reports on the execution of the action, and the foreman accepts the result CA8. Figure 4.8 shows the TPD that is constructed on the basis of examination of the delivery example conversation.

From the example, it can be noticed that the symbols used in the TPD are identical to the symbols used for the TPM as described in the previous chapter. The TPD is just an instantiation of the TPM where transaction states, transitions and communication acts that do not play a role in the transaction process are deleted. When the conversation is expressed in a TPD, a straightforward transaction appears. The TPD's of the communication in field studies will show that not all transaction processes are that straightforward.

Figure 4.8 An example of a transaction process diagram

In the remaining part of the chapter the DEMO models and the TPM are applied to the first field study. The DEMO models are utilized as a means to model the organizations as networks of transactions. The results of the DEMO analysis are extended with the TPM in order to obtain a richer picture of the transaction processes underlying the transaction types. At the same time the communication in
the field study is used to determine whether it is possible to parse the conversations that take place at the identified transaction types onto the TPM.

4.2 Field study I: The University's Scheduling Office

The first field study was conducted in 1993 at the scheduling department of the Faculty of Economics of the University of Limburg in Maastricht. A preliminary analysis of the case study can be found in (Rijst, Reijswoud, 1994). The site of the study was chosen, not because of its overall complexity, but because of the limited, but distinct actions and explicit conversations involved. The objective of the study was to compare the structure of face-to-face transaction processes with the theoretically derived transaction process structure as depicted in the TPM.

The Faculty of Economics offers a four year Master's program with the possibility of various graduation options. The four year course is composed of one year in which a general introduction to economics is provided (propadeuse), two and a half year of specialization in the graduation option selected by the student, and is completed by a small piece of research in a business and a written report on this research. The first year's courses are compulsory and identical for all students, while the program in the second, third and fourth year consists of both compulsory and elective courses.

Each of the four years of the Master's program in Economics is divided into four periods, called blocks. Each block consists of seven teaching weeks, one week for recapitulation and a week of exams. National holidays can cause an extension of the total amount of weeks in which the block takes place. For example, block period 2 lasts two week longer because of the Christmas break. In order to complete the Master's program in four years, the student has to enroll two courses at the time in each block.

During the seven teaching weeks the students meet twice a week for two hours in small tutor groups for each course they have registered. The normal situation is that a student registers for two courses every block. In addition to the course related tutor groups, survey lectures and skills trainings are offered as part of the program. The amount and frequency of survey lectures and skills trainings is determined by the responsible lecturer of the particular course (called the coordinator). The course is limited to a maximum amount of 14 tutor groups and 7 survey lectures in each block. This maximum is based on university regulations.

4.2.1 Description of the scheduling process

Against the organizational background as outlined above, the faculty employs a planning and scheduling officer. The overall task of this officer is to produce a planning of the material resources and a schedule of the educational activities. Both tasks are supposed to incorporate the university's regulations regarding the educational program, as well as lecturers' and students' preferences. It is important to note that personal preferences cannot overrule university regulations, and in the
case of conflicting preferences, the scheduling officer is given the authority to impose a solution.

The planning of the material resources concerns the management of the rooms used for the tutor groups, the survey lectures and the skills trainings, as well as the equipment used during these meetings. The scheduling is guided by the preferences of the responsible lecturers and the availability of the required material resources.

The scheduling of the educational activities involves the determination of the times and dates of the different meetings, and the assignment of students and tutors to tutor groups. The schedule of the educational activities is guided by the preferences of the students, tutors and lecturers involved in a particular course, as well as the interaction between the courses in a particular block.

The production of schedules by the scheduling officer proceeds in four steps:

1. collecting information about the courses;
2. production of provisional schedules;
3. getting approval of the coordinators of the courses;
4. production of final schedules.

The first step of the schedule production process involves the gathering of information constraining the production of the schedule. The basis material for the production of the concept schedule is retrieved from the previous year's schedule. Updated information for this year's schedule is obtained from a standard form that has been send to the coordinators of the courses. In these forms the coordinators are asked to report desired changes and new items in the course. On the basis of this information a concept schedule is produced by the officer. All the coordinators of the courses, as well as the coordinators of the year, have to approve the concept schedule (non-response also is considered to be an approval). In the last step of the schedule production process, the concept schedule is extended with the changes proposed by the coordinators of the course, and the names of the students and tutors. The names of the students are added on the basis of a course registration that has been submitted by the student at the end of the foregoing academic year. The schedule and the list of student names together constitute the final schedule. This final schedule is distributed to the students one week before the start of the new block.

According to the regulations, only the students are allowed to request for changes in the final schedule. Changes can only concern changes of tutor groups, so, students can only change the list of names attached to the final schedule. When the student requests changes involving a change of course, the normal procedure is that the student has to discuss the proposed changes with the study advisor. The study advisor will approve the change against the regulations concerning the composition of the curriculum. When the advice is positive, the student is allowed to request for changes to the final schedule with the scheduling officer. If the changes only concern switching of tutor groups, the student can direct the request directly to the scheduling officer. The scheduling officer is not compelled to honor the requests of students, he will only change when it does not conflict with the constraints incorporated in the schedule.
After the block period is finished, the officer incorporates all the changes of the students in a definitive version of the final schedule. This version of the schedule is sent to the university’s administration.

### 4.2.2 The DEMO analysis of the Scheduling Office

The DEMO analysis of the scheduling office as network of transaction is presented in three partial models. The first model that is presented in this section, is the CM, then it continues with the PM, and finally the FM is presented.

<table>
<thead>
<tr>
<th>Transaction Type</th>
<th>Initiator</th>
<th>Executor</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 Producing_provisional_schedule</td>
<td>A1.1 Produce-Provisional-Schedule</td>
<td>A1.1 Produce-Provisional-Schedule</td>
</tr>
<tr>
<td>T2 Approving_provisional_schedule</td>
<td>A1.2 Change-Provisional-Schedule</td>
<td>A0.1 Coordinator</td>
</tr>
<tr>
<td>T3 Changing_provisional_schedule</td>
<td>A0.1 Coordinator</td>
<td>A1.2 Change-Provisional-Schedule</td>
</tr>
<tr>
<td>T4 Producing_final_schedule</td>
<td>A1.3 Produce-Final-Schedule</td>
<td>A1.3 Produce-Final-Schedule</td>
</tr>
<tr>
<td>T5 Changing_final_schedule</td>
<td>A0.2 Student</td>
<td>A1.4 Change-Final-Schedule</td>
</tr>
</tbody>
</table>

Table 4.1 Transaction table of the Scheduling office

The DEMO analysis of the scheduling officer’s activities starts with the identification of the transaction types, together constituting the core of the business process. The transaction types are identified in conjunction with the actors involved in the transaction. In the field study, five different transaction types are identified: production of the provisional schedule, changing the provisional schedule, approving the provisional schedule, production of the final schedule, and changing the final schedule. This last transaction type concerns changes to an attached list that contains the distribution of students in tutor groups and courses. The transaction table (table 4.1) of the field study summarizes these transaction types with the actors involved in their role of initiator or executor of the transaction type.

For each transaction type in the transaction table, the fact type(s) of which instances are created as a result of the successful execution are specified. These fact types are called facta types. Next to the specification of facta types data types are specified. Data types represent the actual state of affairs that restricts the ‘playing ground’ of the interacting actors. Instances of data types are the results of the successful carrying through of transaction processes outside the system under consideration.

The Data/Facta table (table 4.2) provides an overview of the data and facta types that occur in the scheduler’s office. The table additionally specifies the location of the fact types in the last column.

The five different transaction types are graphically represented in the Communication Diagram of the field study (see figure 4.9). The diagram is best understood by following the scheduling process, from the request to accomplish a provisional schedule until the completion of the final schedule, including all the intermediate steps required for the planning and scheduling of the different courses.
<table>
<thead>
<tr>
<th>Actor</th>
<th>Fact Type</th>
<th>Data/Facta</th>
<th>Resides In</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1.1 Produce-Provisional-Schedule</td>
<td>1 target_group</td>
<td>D</td>
<td>E2</td>
</tr>
<tr>
<td></td>
<td>2 subject_responsibility</td>
<td>D</td>
<td>E2</td>
</tr>
<tr>
<td></td>
<td>3 block_description</td>
<td>D</td>
<td>E2</td>
</tr>
<tr>
<td></td>
<td>4 course</td>
<td>F</td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>5 examination_week</td>
<td>F</td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>6 teaching_week</td>
<td>F</td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>7 study_week</td>
<td>F</td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>8 recess_week</td>
<td>F</td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>9 schedule_week</td>
<td>F</td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>10 week_of_the_year</td>
<td>D</td>
<td>E1</td>
</tr>
<tr>
<td></td>
<td>11 starting_date</td>
<td>F</td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>12 final_date</td>
<td>F</td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>27 year_period</td>
<td>D</td>
<td>E1</td>
</tr>
<tr>
<td></td>
<td>24 meeting</td>
<td>F</td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>31 coordinator_course</td>
<td>D</td>
<td>E2</td>
</tr>
<tr>
<td>A1.2 Change-Provisional-Schedule</td>
<td>provisional_schedule (composed of FT4,5,6,7,8,9,11,12,24,31)</td>
<td>D</td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>4 course</td>
<td>F</td>
<td>T3</td>
</tr>
<tr>
<td></td>
<td>24 meeting</td>
<td>F</td>
<td>T3</td>
</tr>
<tr>
<td>A1.3 Produce-Final-Schedule</td>
<td>4 course</td>
<td>D</td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>13 tutor_group</td>
<td>F</td>
<td>T4</td>
</tr>
<tr>
<td></td>
<td>14 tutor_group_tutor</td>
<td>F</td>
<td>T4</td>
</tr>
<tr>
<td></td>
<td>15 tutor_group_member</td>
<td>F</td>
<td>T4</td>
</tr>
<tr>
<td></td>
<td>16 tutor</td>
<td>D</td>
<td>E4</td>
</tr>
<tr>
<td></td>
<td>17 student</td>
<td>D</td>
<td>E5</td>
</tr>
<tr>
<td></td>
<td>18 student_number</td>
<td>D</td>
<td>E5</td>
</tr>
<tr>
<td></td>
<td>19 time_preference</td>
<td>D</td>
<td>E5</td>
</tr>
<tr>
<td></td>
<td>20 IM_student</td>
<td>D</td>
<td>E5</td>
</tr>
<tr>
<td></td>
<td>21 Erasmus_student</td>
<td>D</td>
<td>E5</td>
</tr>
<tr>
<td></td>
<td>22 ECT_student</td>
<td>D</td>
<td>E5</td>
</tr>
<tr>
<td></td>
<td>23 subsidiary_student</td>
<td>D</td>
<td>E5</td>
</tr>
<tr>
<td></td>
<td>24 meeting</td>
<td>F</td>
<td>T4</td>
</tr>
<tr>
<td></td>
<td>25 meeting_room_number</td>
<td>F</td>
<td>T4</td>
</tr>
<tr>
<td></td>
<td>26 time_code</td>
<td>D</td>
<td>E1</td>
</tr>
<tr>
<td>A1.4 Change-Final-Schedule</td>
<td>final_schedule (composed of provisional_schedule + FT 13,14,15)</td>
<td>D</td>
<td>T4</td>
</tr>
<tr>
<td></td>
<td>28 subject_change</td>
<td>D</td>
<td>E6</td>
</tr>
<tr>
<td></td>
<td>29 time_change</td>
<td>D</td>
<td>E6</td>
</tr>
<tr>
<td></td>
<td>15 tutor_group_member</td>
<td>D/F</td>
<td>T4/T5</td>
</tr>
<tr>
<td></td>
<td>30 student_course</td>
<td>D/F</td>
<td>T4/T5</td>
</tr>
</tbody>
</table>

Table 4.2 Data/Facta table of the Scheduling Office

The gray colored border delineates the kernel of the system. The actors Student and Coordinator are external actors, while the actors Produce-Provisional-Schedule, Produce-Final-Schedule, Change-Provisional-Schedule, and Change-Final-Schedule represent the kernel actors.

The scheduling process starts with the transaction T1:Producing_provisional_schedule, by means of the actor Produce-Provisional-Schedule producing a preliminary schedule, called the provisional schedule. Actor A1.1 is both initiator and executor of this transaction T1. Here it is observed that the actor Produce-Provisional-Schedule is not activated by an external actor, but activates itself (this
point is also illustrated in the ASD, see: figure 4.10). After the production of the provisional schedule, the actor A1.2 (Change- Provisional-Schedule) asks the coordinator to approve the schedule by means of transaction T2 (Approving_provisional_schedule). The coordinator takes notice of the provisional schedule by means of an informative conversation with the fact bank of transaction type T1. When the coordinator of the course does not respond, he implicitly approves the schedule. This is an agreement made between the scheduling officer and the coordinator. On the other hand, if the coordinator likes something to be changed in the provisional schedule, he will have to request actor A1.2 to make the change. This request initiates transaction T3 (Changing_provisional_schedule). While the actors are communicating this transaction, transaction T2 is pending. Transaction T2 will only continue and can only succeed when transaction T3 is completed. Transactions of this type are called nested transactions.

![Diagram](image)

Figure 4.9 The Communication Diagram of the Scheduling Office

When the provisional schedule has been approved by the coordinator of the course and requested changes have been communicated successfully, actor A1.3 (Produce-Final-Schedule) starts the transaction T4 (Producing_final_schedule). For the performance of this transaction the actor consults the external fact banks ‘Location data’ (available accommodation), ‘Tutor data’ (available tutors), and ‘Student data’ (registered students), as well as fact bank of transaction T1 (provisional schedule). When the final schedule is produced, that is to say when the objective action is executed, it is distributed to the students. On the basis of this schedule, only the students are allowed to request for changes. By means of transaction T5:Changing_final_schedule, requests for changes of tutor group are made. If the requested change needs an approval of the study advisor, actor A1.4 will look for a fact of this kind in the external bank ‘Approval advisor’. The transaction T4 and
therewith the scheduling process is completed when actor A1.4 has made the requested changes and has stored the resulting facts in the fact bank of transaction T4.

A better understanding of the transaction sequence in the scheduling process is provided by the DEMO process model that models the timely aspect of transaction types. The PM of the scheduling process is shown in figure 4.10.

![Diagram](image-url)

Figure 4.10 The Action Sequence Diagram of the scheduling process

The facts created in the transactions and facts originating from external transactions (residing in the external banks, denoted with E_n) are summarized in the Data/Facta Table of the field study (Table 4.2). These facts are represented using the Fact Diagram in figure 4.11.

### 4.2.3 Analyzing transaction processes with the TPM

The previous paragraph has presented an analysis of the Scheduling Office in terms of transaction types and actors, the sequence of occurrence of the transaction types, and the resulting and associated facta and data. Based on this analysis, the application of the TPM and the TPD to the communication in the field study is illustrated. Since the DEMO analysis describes and analyzes transactions in organizations, it forms a necessary starting point for the application of the TPM because the model supposes that the transaction types in an organization are known.

The material used for the application of the TPM consists of audio-taped conversations between the scheduling officer and people visiting the scheduler's office at the university. All the recordings were made during the daily consulting hour of the officer. The consulting hour is open for questions of both students and lecturers/tutors/coordinators. However, the majority of conversations involved students asking questions. The recordings were made with a small tape recorder and in the presence of the researcher. The transcribed audio-recordings were parsed onto the TPM.

The parsing process on the basis of turn-taking proved to be unproblematic in the majority of the transcribed conversations, the so-called explicit transaction processes. In the parsing of some transaction processes problems were encountered as well. In paragraph 4.3.3.1 some unproblematic examples are illustrated, while the next paragraph discusses the problems with, so-called, implicit transaction processes.
Figure 4.11 The Facts Diagram of the Scheduling Office

4.2.3.1 Explicit transaction processes

The previous chapter explained that transactions processes have to proceed along at least the four transaction states and accompanying communication acts at success-layer of the TPM before a fact can be created in transaction state 5. If one of these states or acts is lacking, the transaction process ends unsuccessfully in state 8. Both
final states may be reached after a discussion about validity claims or even after a
discourse. The CA’s of the initiator and the executor have to appear in turns, starting
with a request for action and ending with the final declaration of success or failure.
Face-to-face transaction processes that comply with these rules are called explicit
transaction processes. In this paragraph the use of the TPM for the understanding of
these transaction processes is illustrated.

The most frequently observed transaction processes in the field study were student-
initiated requests for change of tutor group or course. These conversations formed
the majority of the recorded transaction processes during the daily consulting hour.
Below is an illustration of a successful transaction of this kind. The scheduling
officer is abbreviated to ‘SO’ and the student to ‘S’. A numbering communication
acts is added on the basis of turn-taking by the participants in the conversation.

CA1  S:  “Hello, I would like to change tutor groups.”
CA2  SO: “Then you’re at the right place. What’s your question?”
CA3  S:  “On the schedule in the main hall I’ve read that I’ve been assigned to
an afternoon group, while I prefer a tutor group in the morning. Can
this be changed?”
CA4  SO: “The schedule can only be changed if you have a valid reason.”
CA5  S:  “The reason is that I’m a student at the law school as well, and I’ve to
attend lectures in the afternoon there.”
CA6  SO: “OK, if you give me your details, I’ll change the schedule right away, if
possible.”

“What’s the course we’re talking about?”
CA7  S:  “Introduction to Marketing.”
CA8  SO: “What’s the number of the group you have been assigned to?”
CA9  S:  “43.”
CA10 SO: “What’s your student number?
CA11 S:  “E 88184”
CA12 SO: “Fine, that’ll do. Let me see if there’s a possibility for change.”
   <silence, the officer looks through several lists>
CA13 SO: “Here it is, your new tutor group is group 18. It’ll start at 8.30 in the
   morning in room 1013.”
CA14 S:  “Thanks for helping me out.”

If a TPD of the transaction process is to be drawn, it is best to start with the
determination of the proposition of the transaction process. On the basis of the
DEMO CM, presented in the previous paragraph, it can be observed that the
transaction process belongs to the transaction type T5:Changing_final_schedule
initiated by the external actor Student, and executed by the internal actor Change-
Final-Schedule. When propositions are considered, it is also important to consult

1 The conversations are translated from Dutch by the author.
the Data/Facta table of the DEMO analysis. This table provides an overview of the new facts that are created as result of the successful carrying through of a specific transaction type. From the Data/Facta table and the FD is can be determined that the new facts that are created in T5 are instantiations of the fact types FT15 tutor_group_member and/or FT30 student_course. Next to these facta types, the Data/Facta table that there are data types. These data types, concern information that is retrieved by means of informative conversations with the banks of other transaction types.

The formulation of the proposition in an actual conversation evolves through some iterative steps. As I have mentioned before, in the TPM the proposition is formulated as a true statement (or constative). In this form it describes the fact that is created when the transaction ends successfully. The observed conversations in the field study show that a proposition is seldom formulated exhaustively in the first request to perform some action. When the proposition of the conversation above is considered, it is observed that its formulation develops through several steps. In CA1 the proposition <tutor groups are changed> is proposed by the actor Student.\(^2\) The utterance incorporates no explicit information about the fact types FT15 tutor_group_member or FT30 student_course. Information about these fact types is expected on the basis of the Data/Facta table of the study (table 4.2). In CA3 the student reformulates the request more explicitly after the scheduling officer invites the student to formulate one ("What's your question?"). The resulting updated proposition is <the student is assigned to a tutor group with time code 1 or 2>. The time codes 1 and 2 are codes to refer to tutor groups in the morning (see FT26 in the facts diagram displayed in figure 4.11). In CA4, CA5, and the first sentence of CA6, the conditions for a request to change are evaluated and approved. In the CM (figure 4.7) these communicative exchanges fit in with the informative conversation with the external bank E6 by A1.4 Change-Final-Schedule. The data that are checked by means of this conversation, are represented in the FM as FT28 and FT29. By means of the second sentence of CA6 to CA11, the scheduling officer asks the student to provide more information that is necessary for the officer to execute the objective action of the transaction. First, he needs to know the name of the course, then the number of the group, and finally the number of the student. After these three questions (and answers), the scheduling officer has enough information, and the following proposition is formulated:

the student currently assigned to tutor group 43 with student# E88184 is re-assigned to tutor group with time code 1 or 2 of the course Introduction to Marketing

By means of CA12, the scheduling officer apparently promises to perform the action because he starts to execute the requested objective action.

In CA13 the scheduling officer states the completion of the execution of the objective action. He states that the student is re-assigned to a morning group and

\(^2\) In this conversation the time-for-completion is not mentioned, and is most likely to be set to 'now'. Because the time-of-completion is not under consideration in the conversation, it is not mentioned explicitly in the proposition.
mentions the number of the new tutor group. He also adds some additional information about the location of the group. The student accepts the result of the execution of the action with the remark “Thanks for helping me out”, and completes the transaction process.

When the individual communication acts in the conversation are represented in the formula for communication acts, the proposition formulation process in the transaction process becomes very clear. It is observed that the predication of the proposition contains more elements when a new request for action is formulated. The new elements have been underlined. The CA's that are used for the checking of the study advisor’s approval have been deleted for the sake of clarity. The action type is set to communicative (C), and the time for completion is set to ‘now’, meaning as soon as possible.

CA1 S: C [request action(directive)<the student is re-assigned to tutor group, now>]

CA2 SO: C [reformulate request(directive)<the student is re-assigned to tutor group, now>]

CA3 S: C [request action(directive)<the student is re-assigned to tutor group with time code 1 or 2, now>]

... ... ...

CA6b SO: C [reformulate request(directive)<the student is re-assigned to tutor group with time code 1 or 2, now>]

CA7 S: C [request action(directive)<the student is re-assigned to tutor group with time code 1 or 2 of the course Introduction to Marketing, now>]

CA8 SO: C [reformulate request(directive)<the student is re-assigned to tutor group with time code 1 or 2 of the course Introduction to Marketing, now>]

CA9 S: C [request action(directive)<the student currently assigned to tutor group 43 is re-assigned to tutor group with time code 1 or 2 of the course Introduction to Marketing, now>]

CA10 SO: C [reformulate request(directive)<the student currently assigned to tutor group 43 is re-assigned to tutor group with time code 1 or 2 of the course Introduction to Marketing, now>]

CA11 S: C [request action(directive)<the student with student# E88184 currently assigned to tutor group 43 is re-assigned to tutor group with time code 1 or 2 of the course Introduction to Marketing, now>]

CA12 SO: C [promise(commissive)<the student currently assigned to tutor group 43 with student# E88184 is re-assigned
to tutor group with time code 1 or 2 of the course
Introduction to Marketing, now>]

CA13 SO: C [state result(assertive)< the student currently
assigned to tutor group 43 with student# E88184 is
re-assigned to tutor group with time code 1 or 2 of
the course Introduction to Marketing, now>]

CA14 S: C [accept(declarative)< the student currently
assigned to tutor group 43 with student# E88184 is
re-assigned to tutor group with time code 1 or 2 of
the course Introduction to Marketing, now>]

Although the transformation of the conversation to the formulae seems to be
unambiguous, it incorporates an important decision. In the conversation two
utterances can be understood as the commissive CA that concludes the actagenic
conversation; the actagenic commissive. The first utterance is CA6, first sentence. In
this utterance the scheduling officer seems to promise to change the schedule (“I’ll
change the schedule right away.”), however, there is a condition on the commissive,
namely: “..., if possible.”). The second candidate for the title of actagenic
commissive is CA12. This utterance exhibits less of the typical pattern of a
commissive act, but a functional decomposition shows that it is a commissive act.
The selection of either of the two utterances as the actagenic commissive has strong
implications for the understanding of the structure of the transaction process. If CA6
is chosen, the questions in CA6b, CA8, and CA10 become part of the execution of
the objective action, while in the other case these questions are interpreted as being
part of a continuous process of proposition formulation. In cooperation with the
scheduling officer I have chosen to identify CA12 as the actagenic commissive,
because the officer stated that he can only promise to make a change when he is in
the possession all the information needed for this change. On the basis of this
consideration TPD as presented in figure 4.12 is drawn. The parsing of the CA’s
onto the TPM reveals a rather straightforward transaction process. Once a complete
proposition is agreed upon, the transaction process proceeds on the success-layer
without communication obstacles.

Figure 4.12 TPD of an explicit transaction process to change tutor groups
When the FD of this field study is examined, it can be observed that FT15 tutor_group_member is affected by the successful execution of this transaction process. The student is assigned to a new group, and therewith the extension of FT15 is changed; an old instance is deleted and a new one is added. In the CM no changes occur, because this model describes the types of transaction processes that take place in the organization, and therefore it is a stable model which is not affected by the carrying through of individual transaction processes.

Although the majority of the observed conversations during the consulting hour were transaction processes that took place solely at the success-layer of the TPM, some deviations from the success-layer were also observed. The most obvious deviations from the success-layer are unsuccessful transaction processes. These transactions turn away from the success-layer, and eventually end in the final transaction state 8. The unsuccessfulness of a communicative oriented transaction process may manifest itself with or without a discussion about validity claims. The transcribed conversation below illustrates a transaction process that ends unsuccessfully after a discussion about the claim to truth.

CA1 S: "Hello, I've signed up for the Marketing Research course, but I'd like to switch to the Project Management course 5943."

CA2 SO: "Who told you that there will be a Project Management course this block period?"

CA3 S: "I just had a meeting with the study advisor with whom I've discussed my future plans. He told me that it would be better to attend more courses with the Informatics department, and advised me to sign up for the Project Management course."

CA4 SO: "Project Management will be taught next period, so you may have misunderstood the study advisor."

CA5 S: "May be."

CA6 SO: "Anyhow, I can't sign you up."

CA7 S: "I understand, but I can't see why the advisor said this to me.

What other courses are being taught this block period?"

In this example the student initiates a transaction process to change the course. The requested change proves to be impossible under the given circumstances. However, the scheduling officer wants to know whether there is something going on of which he is not aware of (CA2). After hearing that the information was provided by the study advisor, he decides that this information cannot be true. In CA4 the scheduling officer counters the request of the student and informs him about the reason. The reason concerns the truth of the initial request, and he therewith suggests that the student misinterpreted the information supplied by the advisor. The student replies with a weak confirmation. Then the scheduling officer declines (CA6), the student understands the reason for the officer's decline and accepts (grumbling) the officer's desire to cancel the transaction process (CA7). The conversation ends with a request for information about other possibilities.
The course of the transaction process with the discussion about the claim to truth and resulting unsuccessful ending is depicted by means of a TPD in figure 4.13.

Figure 4.13 TPD of an unsuccessful attempt to change subject

Other conversations that deviated from the success-layer that occurred more than once in the study, were requests from students for a change of a course without having an approval of the study advisor. It is a university rule that the student needs the study advisor's approval for a change of course. Without this approval the scheduling officer is not allowed to carry out changes. The transaction process moves towards an unsuccessful ending as soon as the scheduling officer finds out that there is no approval of the study advisor for the desired change of the student. The TPD of these transaction processes show the following pattern (see figure 4.14)

Figure 4.14 TPD of unsuccessful attempts to change course without approval

Strategic oriented transaction processes were not encountered during the observed consulting hours. Although the university can be characterized as being a mechanistic organization, the absence of strategic oriented transaction processes is not surprising. The reason for their absence is due to the powerless relationship between the scheduling officer and the student. The student possesses no sanctions that can be used when the scheduling officer refuses to perform some requested action. Only when the scheduling officer acts unreasonably, or not in line with the university regulations, the student is permitted to discuss the scheduling officer's
behavior with the head of the planning and scheduling department. According to the scheduling officer these situations seldom occur. From the interviews with the scheduling officer it became clear that the officer considers strategic oriented transaction processes considers to be unjust. When he suspects a request to be strategic oriented, he declines to perform the action. This results in an unsuccessful ending of the transaction process. The usual response to this unsuccessful ending is the initiation of a communicative oriented transaction process by the student. These transaction processes are semi strategic oriented transaction processes, and the scheduling officer reproves these students about their assumed hierarchical power.

The recordings made at the scheduler's office do not contain conversations that proceed through the discourse-layer of the TPM. In the previous chapter these conversations were characterized as discussion-like conversations in which new organizational rules are established. The conversations at the scheduler's office all relate to instantiations of particular fact types. New or changed organizational rules are discussed in departmental meetings, which I have not been allowed to attend.

4.2.3.2 Implicit transaction processes

One of the basic hypotheses underlying the field study was that all conversations develop along the lines of the transaction process model. The main reason for this hypothesis is derived from the transaction concept on which the TPM is based. The transaction concept supposes three necessary parts in performative communication, namely, the actagenic conversation, the objective action, and finally the factagenic conversation. For the creation of a fact, it is necessary that the communication develops through these three parts. The explicit transaction processes, as presented in the previous paragraph, confirmed the hypothesis. However, in the field study also some conversations were observed that seemed to contradict the basic assumption of the transaction concept. In terms of the transaction concept, incomplete transaction processes were observed. In some conversations the actagenic part was missing, while in other conversations, the factagenic part was missing. The missing part of these conversations could not be traced in other places in the recordings. Anticipating the conclusion of this paragraph, I will call these incomplete transaction processes, implicit transaction processes. The current paragraph presents some examples of these implicit transaction processes and establishes a preliminary understanding of their structure.

The first example of a seemingly incomplete transaction process concerns a request by a lecturer for some additional material. The lecturer is abbreviated to 'L' and the scheduling officer to 'SO'.

CA1  L:  "Hello Frank, Monday morning I'll need an overhead projector in room 1013.
Can you arrange that?"

CA2  SO:  "No problem. What time do you need it?"

CA3  L:  "8.30."

CA4  SO:  "It will be there."

<conversation stops and lecturer leaves room, and SO calls the janitor>
In this conversation, it is observed that CA1-CA3 are used to formulate the proposition of a request for action. In the formalized notation the request can be transformed to:

CA3  L:  C [request(directive)<room 1013 is equipped with overhead projector, next Monday 0830 hours>]

In CA4 the scheduling officer promises that the overhead projector will be ready in room 1013 on Monday morning.

CA4  SO:  C [promise(commissive)<room 1013 is equipped with overhead projector, next Monday 0830 hours>]

As a response to the request, the scheduling officer calls the janitor of the building and politely requests him to deliver an overhead projector to room 1031 on Monday morning 8.30. At this moment in time the conversation stops and a continuation, in the form of a factagenic conversation, has not been traced in the remaining part of the observations.

When the conversation is transferred into a TPD, the incompleteness becomes even more obvious (see figure 4.15). After the scheduling officer requests the janitor to take care of the overhead projector, the transaction process comes to an end. The initiator of the transaction process, the lecturer, is not informed verbally about the result of the execution of the requested objective action, and also he does not declare his satisfaction with the result.

![Figure 4.15 TPD of an incomplete transaction process in which additional material is requested](image)

On another occasion, a clue for the understanding of the incomplete transaction process was observed. Just after the consulting hour one of the lecturers came to the office of the scheduling officer and the following conversation was observed:

CA1  L:  "Hello Frank, I’d requested a VCR and a television in the lecture hall. When I just walked in to get everything ready, there was nothing, only an overhead projector."

CA2  SO:  "There must have gone something wrong. I have noted your request for a VCR and asked the janitor to install one."

CA3  L:  "I don’t care, I need one immediately!"

CA4  SO:  "I will make a call immediately, wait a minute, please."

<the scheduling officer makes a phone call with the janitor>

CA5  SO:  "It will be there within 15 minutes."

CA6  L:  "OK, I hope it will be alright now."
Figure 4.16 presents the TPD of this part of the conversation. From the diagram it is observed that the lecturer initiates a factagenic discussion with CA1. This concerns a discussion about the truth of a CA that states that the objective action is performed. This actual utterance has not been traced in the recordings, but with CA1 the lecturer implies its existence. The scheduling officer acknowledges (CA2), and the lecturer requests to redo the execution of the objective action (CA3). After the phone call (OA) and from the scheduling officer’s statement that the objective action is performed (CA5), the lecturer accepts, with reservation (the reason for putting CA6 between brackets), the completion of the transaction process.

![TPD diagram]

Figure 4.16 TPD of an incomplete transaction process in which a discussion leads to a redo of the requested action

With regard to the TPD’s, both conversations reveal an incomplete transaction process, but a closer look suggests that the missing elements remain implicit to the face-to-face communication process. In the first conversation a request is made by the initiator and the executor promises to perform the action. The actual execution of the objective action is performed by the janitor. Although he installs the VCR in the room, the scheduling officer remains the responsible actor. With the second example in the back of our minds, it can be imagined how the transaction proceeds. The initiator of the action, the lecturer, enters the room on the day in question, and checks the result of the execution of the objective action. If he considers the result to be in accordance with his initial request, he will accept the result and therewith he brings the transaction process to a successful ending. In other words, if he does not find the overhead projector in the room, he will return to the scheduling officer to start a discussion about the result of the execution of the action and possibly requests a ‘redo’ of the execution of the action. This is what actually happened in the second conversation.

The analysis of the conversations in the field study reveal that, although the identified steps in a transaction process are not always performed explicitly, a transaction process can still be considered to end successfully. When the scheduling officer was questioned about this peculiarity, he explained that many conversations with the staff of the university about the scheduling and schedule related topics are based on an implicit agreement principle; this means that a non reply is interpreted as an agreement. In some transaction related documents, like the provisional schedule document used in transaction T2:Approving_provisional_schedule, this principle is mentioned explicitly at the end of the document. Most of the time,
however, it is an organizational rule that is known by its members. On the basis of the characterization of norms in section 3.3.3.3 of the previous chapter, rules of this kind are classified as explicit informal norms of an organization that are the result of a discourse held some moment in the past. In the case of the scheduling office, the implicit agreement was introduced when the university grew bigger and explicit communication took too much time.

4.3 Conclusions of the first field study

The field study at the university's scheduling office was designed to establish the empirical relation between the actual communication in organizations and the theoretical TPM. This relation has been brought into existence through the parsing of transcribed face-to-face conversations observed at the office of the scheduling officer onto the TPM. The parsing resulted in TPD's of the actual conversations. The TPD's revealed some interesting characteristics of the conversations in relation to the TPM.

Transaction processes between two different actors that take place face-to-face, and that are completed in the same meeting, conform with the communication steps as postulated in the TPM. The parsing of these conversations onto the TPM could easily be achieved with the research data of the field study.

Transaction processes that take place face-to-face between two actors, but of which the start and the (successful or unsuccessful) completion stretch out over a longer period of time could also be parsed onto the TPM. However, the parsing process is more complicated because it is difficult to trace the different element parts of the transaction process. Unlike letters that make explicit their linkage in subject headings and reference numbers, the participants involved in face-to-face transaction processes use less explicit reference to relating parts of their conversations. However, with the help of the participants involved in a transaction process the link between different components of the transaction process could be brought to the surface.

Transaction processes that are partly non-verbal have proven to be a source of problems in the parsing process. The parsing of some conversations in the field study resulted in an incomplete TPD, which I have named implicit transaction processes. The remaining part of the transaction process is completed according to the implicit agreement principle. These implicit parts are made explicit when there occurs a breakdown in the process.

Some transaction processes in the case study are performed entirely in written language. The transaction T2: Approving provisional schedule is a good example of this type of transaction processes. This transaction type involves a lot of standardized forms, and hardly any face-to-face communication. Since the field study primarily focused on face-to-face communication, these written conversations have not been within the scope of the field study, and thus need further examination by means of a second study.
A different point that is observed from the analysis of the structure of the transaction processes in the field study, is that CA's were observed with the goal to provide information necessary in the transaction process. The example of the transaction process in which a student tried to change tutor-groups clearly illustrated this communication behavior. When this phenomenon is related to the organizational communication categories identified in the previous chapter, these CA's, CA4 to CA6a in the first example concerning the requested change of courses, belong to the category of information providing communication. I have described this category as communication that is used to retrieve extra information that is necessary to perform some (communicative or objective) action. In the DEMO approach these types of communication are called informative conversations and are visualized in the CM as dotted lines between an actor and a bank. In the TPM I have not identified this type of communication; the focus of the TPM is solely on action initiating and action providing communication. On the basis of the observations in the field study it is justifiable to include this information providing communication because it forms an important element of the transaction process. Without the inclusion of this information providing communication possibility, some CA's are not classifiable in the TPM, which limits the completeness and usability of the model for the understanding of business communication.

On the basis of the observations of the field study the extra communication possibility to retrieve information that is necessary, is added to the states of the TPM. In the description of the transaction state in the previous chapter, I have stated that only CA's are being started from this state. This definition is extended so that also communication to provide information may be started from the transaction states. Following the line of thought of the DEMO approach, the possibility to start information providing conversations is visualized as follows (see: figure 4.17): the informative link and the bank symbol are connected to the transaction state when some of the CA's in a conversation are used to retrieve additional information. The numbered CA's are added next to the dotted line connecting the transaction state and the bank, and in the bank symbol the name of the consulted bank(s) may be added. In the next field study this extension to the TPM will be illustrated.

![Figure 4.17 Extension to the TPM to indicate information providing CA's](image)

The last remark that has to be made on the basis of the results of the field study is the lack of research data on the discourse-layer and the minimal data on the strategic oriented transaction process structure of the TPM. In the field study I have observed a part of a mechanistic organization where strategic oriented transaction processes
are rarely observed. On the basis of this observation it is hypothesized that communication characteristics of mechanistic and organic organization need to be defined at a lower level than the organization as a whole. The lack of research data on discourses may be caused by the fact that no meetings observed in the study.

As a general conclusion to the results of this field study, it needs to be said that the design of the study, where the focus has been solely on face-to-face verbal conversations, has proven to provide important insights in the structure of transaction processes, but also that it is too limited to establish a full empirical understanding on the TPM and the praxis of organizational communication. It has been observed that written communication seems to play a more important role in the coordination of action in an organization than was expected. The exclusion of verbal communication other than face-to-face contact may be the cause of the existence of only a preliminary understanding of incomplete TPD’s.

Although the first field study has shown that the TPM provides very useful insights in the structure of business communication, the design that focused on verbal face-to-face communication has also proven to obstruct a full understanding. The limitations of the first study formed the guidelines for the design of the a second field study. The goal of the second study is to supplement the results of the first field study. This means that the focus of the research needs to be on both spoken and written communication in the organization under study because both seem to play an important role in the transaction process. The attention on written communication in the organization may provide additional information on the implicit transaction processes. Also, attention need to be paid to information providing communication in transaction processes and communication at the discourse-layer of the TPM. In order to observe the last aspect, it is hypothesized that meetings will provide research data on discourses.
5

Field Study 2
The Profiles Company

The second field study which has been performed concerned the analysis of the business processes of a medium size production company producing high quality aluminum window frames, inside the company called Profiles. The field study was conducted in 1994. This study was initiated as an extension to the first field study at the university’s scheduling office. The limited results caused by the design of the first field study formed the guidelines for the design of this study. This means that written communication, the role of information providing communication in the transaction process, and discourses are spear points in the study.

The answer to the limitations of the first field study was thought to be found in an increase in scale of the research. This implied that the study concerned an entire business process instead of the scheduling activity, which is a sub-process of a larger bureaucracy. The scaling-up of the study allowed to observe more different kinds of transaction processes. It was decided that after an initial analysis of the transaction types in the organization the focus would shift to some transaction types which looked rich in terms of written communication, information providing communication, and discourses.

The research methodology that was followed in the analysis of the Profiles Company is similar to the research methodology used in the analysis of the scheduling office. First the business process of the company is described globally (section 5.1), then it
is analyzed using the DEMO method (section 5.2), and finally the communication involved in some of the transaction types is considered in detail with the TPM (section 5.3). In view of the size of the study, the level of detail presented in the DEMO analysis is decreased compared to the previous study. The chapter concludes with some remarks about the results of the field study (section 5.4).

5.1 Description of the business process

The global business process of the Profiles Company is best described on the basis of the order routing:

Potential customers are visited by one of the salesmen of the company. After negotiating the technical details of the desired product, the salesman prepares and presents an offer based on the calculated costs of the project as well as the business relationship with the customer. Regular customers get more competitive offers than new customers. When the offer is made, the salesman rates the changes of the offer. The calculation of the offer is performed by a costing-clerk. The clerk has at his disposal all the material and related construction details of all the requested profiles so that he can make an estimate of the costs of the requested project. If a customer decides to place an order, a final calculation is made because of the possible negotiated changes of the design in this stage of the order process. The first step after the order gets the status 'definitive', is the preparation of the drawings on the basis of the project description of the order as reported by the salesman. These drawings, that are prepared on the basis of the project description, must be evaluated by the customer, and the order routing halts until the customer agrees with the drawings. As soon as the customer agrees on the drawings, the purchase department places purchase orders at the suppliers of element parts. There are three types of suppliers: profiles suppliers, glass suppliers, and suppliers of accessories like hinges and locks. After the purchase orders are placed, the planner produces a rough planning of the actual production and assembly process of the profiles. The rough planning determines the time limits for the production and assembly of the profiles. The delivery dates of the profiles, and accessories play a very important role in the production of the rough planning (glass is purchased when the profiles are being produced). Every supplier has its own delivery period. The planning is also guided by the delivery date as agreed upon with the customer in the order contract. The feasibility of the rough planning depends heavily on the progress made at the building site. The profiles company is usually just a cog in the (building) machine, and when one of the other participants in the building project fails to meet the deadlines, this may affect the planning of the Profiles Company.

On the basis of the rough schedule, the production and assembly departments produce a detailed planning for the allocation of personnel and resources. The detail schedules are prepared within the boundaries set by the rough planning. If, for any reason, there is not enough personnel available to prepare a project in time, it is possible for the planners of the departments to hire additional personnel from an external employment agency. Meeting the delivery date that has been agreed upon with the customer, and possible other participants in the building project, is
considered to be of extreme importance for the survival of the company. Exceeding deadlines provides a negative image to the company.

The actual production process of the profiles involves a number of steps. After the profiles have been delivered by the supplier, they are sent to an enamel company. There is only a limit number of enamel companies that are used by the Profiles Company, and each of the enamel companies is specialized in a specific enameling technique. In the production hall the enameled profiles are sawn and put together. Meanwhile, glass is ordered in the right size at a glass supplier. The glass needs to arrive at the company when the production of the profiles is finished. The constructed profiles and the glass are shipped together to the building site where they are assembled by a specialized assembly team from the company. Because the Profiles Company has only a limited shipping capacity, the shipping of very large constructions, e.g., glass walls, is contracted out to an external shipping company.

The payment of an order by the customer is normally divided into stages. The amount of the terms varies depending on the size of the order, and the believed reliability of the customer. The last payment is expected immediately after the assembly of the profiles at the building site is finished. The suppliers of the Profiles Company are paid for every order of material or people that is delivered.

5.2 The DEMO analysis of the field study

The analysis of the Profiles Company has been performed with the same three DEMO modeling tools that has been used in the field study of the scheduling office. Because of the size of the business process, I will present the results of the DEMO analysis briefly. A complete analysis of the field study can be found in (Reijswoud, Rijst, 1994b). In this section, I only present the elements of the study that are necessary for the understanding of the next section where a further analysis of individual transaction processes is performed with the TPM. Because of the size of the study of the Profiles Company, the first step of DEMO, the identification of transaction types, is divided in two parts. First, the boundary transaction types are determined, i.e., the transaction types between the Profiles Company and its environment. Then the internal transaction types structure of the company is scrutinized.

The Profiles Company interacts with 6 different actors in its environment. Most important are the Potential-Customer (A0.1) who requests a competitive offer (T1), and the actual Customer (A0.2) who requests the company to deliver and install new window frames (T2). This transaction is accompanied by requests from the Profiles Company to approve the drawings of a particular project (T3), and, of course, to pay for it (T4). The actors Potential-Customer and Customer are in most cases played by the same person, but since DEMO considers functions/roles instead of persons, the same person may be divided into two (or even more) actors. The actors Supplier (A0.3) and the Enamel-Company (A0.4) are directly supporting the core process of the company. The Profile Company requests Supplier to deliver the supplies that are needed for a particular project (T6), and after receiving the
<table>
<thead>
<tr>
<th>Transaction Type</th>
<th>Initiator</th>
<th>Executor</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 Delivering_offer</td>
<td>A0.1 Potential-Customer</td>
<td>A1 Profiles-Company</td>
</tr>
<tr>
<td>T2 Delivering_order</td>
<td>A0.2 Customer</td>
<td>A1 Profiles-Company</td>
</tr>
<tr>
<td>T3 Approving_drafting</td>
<td>A1 Profiles-Company</td>
<td>A0.2 Customer</td>
</tr>
<tr>
<td>T4 Paying_invoice</td>
<td>A1 Profiles-Company</td>
<td>A0.2 Customer</td>
</tr>
<tr>
<td>T5 Paying_supplier_order</td>
<td>A0.3 Supplier</td>
<td>A1 Profiles-Company</td>
</tr>
<tr>
<td>T6 Delivering_supplier_order</td>
<td>A1 Profiles-Company</td>
<td>A0.3 Supplier</td>
</tr>
<tr>
<td>T7 Enameling_profiles</td>
<td>A1 Profiles-Company</td>
<td>A0.4 Enamel-Company</td>
</tr>
<tr>
<td>T8 Paying_enameling_profiles</td>
<td>A0.4 Enamel-Company</td>
<td>A1 Profiles-Company</td>
</tr>
<tr>
<td>T9 Delivering_prod_personnel</td>
<td>A1 Profiles-Company</td>
<td>A0.5 Employment-Agency</td>
</tr>
<tr>
<td>T10 Delivering_ass_personnel</td>
<td>A1 Profiles-Company</td>
<td>A0.5 Employment-Agency</td>
</tr>
<tr>
<td>T11 Paying_delivery_personnel</td>
<td>A0.5 Employment-Agency</td>
<td>A1 Profiles-Company</td>
</tr>
<tr>
<td>T12 Shipping_profiles</td>
<td>A1 Profiles-Company</td>
<td>A0.6 Shipping Company</td>
</tr>
<tr>
<td>T13 Paying_shipping</td>
<td>A0.6 Shipping-Company</td>
<td>A1 Profiles-Company</td>
</tr>
</tbody>
</table>

Table 5.1 Transaction table of the Profiles Company and its environment

![Diagram](image)

Figure 5.1 The Communication Diagram of the Profiles Company and its environment

supplies, the invoice over the materials is paid (T5). The relation to enamel company is identical: profiles are send to be enameled (T7) and after the enameling, the invoice is paid (T8). The Profiles Company only interacts with a Shipping-Company (A0.6) or an Employment-Agency (A0.5) in special cases. In the case of extreme large profiles the help of an external shipping company is called in (T12).
When there is not enough personnel available, for some reason, to complete an order in time, extra personnel is hired from an employment agency. Production personnel is hired by means of T9, and assembly personnel by T10. The transactions T11 and T13 are both transaction types by which the external actors request the Profile Company to pay for their services. An overview of the transaction types, together with their initiator and executor, is displayed in table 5.1.

On the basis of the transaction table the interaction structure of the Profiles Company and its environment is presented by means of a communication diagram (see: figure 5.1). The CD presents all the boundary transaction types with their initiators and executors. The Profiles Company (A1) is a complex actor, which means that its internal transaction structure is (still) hidden.

<table>
<thead>
<tr>
<th>Transaction</th>
<th>Initiator</th>
<th>Executor</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 Delivering_offer</td>
<td>A0.1 Potential-Customer</td>
<td>A1.1 Sales</td>
</tr>
<tr>
<td>T2 Delivering_order</td>
<td>A0.2 Customer</td>
<td>A1.2 Order-Acceptance</td>
</tr>
<tr>
<td>T3 Approving_drawing</td>
<td>A1.8 Plan-Drawing</td>
<td>A0.2 Customer</td>
</tr>
<tr>
<td>T4 Paying_invoice</td>
<td>A1.6 Check-Payment</td>
<td>A0.2 Customer</td>
</tr>
<tr>
<td>T5 Paying_supplier_order</td>
<td>A0.3 Supplier</td>
<td>A1.11 Pay-Purchase</td>
</tr>
<tr>
<td>T6 Delivering_supplier_order</td>
<td>A1.12 Purchase</td>
<td>A0.3 Supplier</td>
</tr>
<tr>
<td>T7 Enameling_profiles</td>
<td>A1.12 Purchase</td>
<td>A0.4 Enamel-Company</td>
</tr>
<tr>
<td>T8 Paying_enameling_profiles</td>
<td>A0.4 Enamel-Company</td>
<td>A1.13 Pay-Enamel</td>
</tr>
<tr>
<td>T9 Delivering_prod_personnel</td>
<td>A1.9 Plan-Production</td>
<td>A0.5 Employment-Agency</td>
</tr>
<tr>
<td>T10 Delivering_ass_personnel</td>
<td>A1.10 Plan-Assembly</td>
<td>A0.5 Employment-Agency</td>
</tr>
<tr>
<td>T11 Paying_delivery_personnel</td>
<td>A0.5 Employment-Agency</td>
<td>A1.7 Pay-Personnel</td>
</tr>
<tr>
<td>T12 Shipping_profiles</td>
<td>A1.9 Plan-Production</td>
<td>A0.6 Shipping-Company</td>
</tr>
<tr>
<td>T13 Paying_shipping</td>
<td>A0.6 Shipping-Company</td>
<td>A1.5 Pay-Shipping</td>
</tr>
<tr>
<td>T14 Checking_payments</td>
<td>A1.6 Check-Payment</td>
<td>A1.6 Check-Payment</td>
</tr>
<tr>
<td>T15 Calculating_offer_costs</td>
<td>A1.1 Sales</td>
<td>A1.3 Calculate-Order</td>
</tr>
<tr>
<td>T16 Calculating_order_costs</td>
<td>A1.2 Order-Acceptance</td>
<td>A1.19 Calculate-Order</td>
</tr>
<tr>
<td>T17 Planning_order</td>
<td>A1.2 Order-Acceptance</td>
<td>A1.4 Plan</td>
</tr>
<tr>
<td>T18 Planning_drawing</td>
<td>A1.8 Plan-Drawing</td>
<td>A1.8 Plan-Drawing</td>
</tr>
<tr>
<td>T19 Planning_production</td>
<td>A1.9 Plan-Production</td>
<td>A1.9 Plan-Production</td>
</tr>
<tr>
<td>T20 Planning_assembly</td>
<td>A1.10 Plan-Assembly</td>
<td>A1.10 Plan-Assembly</td>
</tr>
<tr>
<td>T21 Drawing</td>
<td>A1.8 Plan-Drawing</td>
<td>A1.14 Draw</td>
</tr>
<tr>
<td>T22 Producing</td>
<td>A1.9 Plan-Production</td>
<td>A1.15 Produce</td>
</tr>
<tr>
<td>T23 Assembling</td>
<td>A1.10 Plan-Assembly</td>
<td>A1.16 Assemble</td>
</tr>
<tr>
<td>T24 Shipping</td>
<td>A1.9 Plan-Production</td>
<td>A1.18 Ship</td>
</tr>
<tr>
<td>T25 Checking_stock</td>
<td>A1.12 Purchase</td>
<td>A1.12 Purchase</td>
</tr>
</tbody>
</table>

Table 5.2 Transaction table of the Profiles Company

After the identification of the boundary transaction types, the focus shifts to the internal interaction structure of the Profiles Company. The analysis of the internal structure of the Profiles Company, combined with the already identified analysis of
the boundary transaction types, results in the following complete transaction table of the field study (see: table 5.2).

![Diagram of transaction structure and environment of Profiles Company]

Figure 5.2 The Communication Diagram of the internal structure and the environment of the Profiles Company

The analysis of the internal transaction structure of the Profile Company adds 12 transaction types to the existing boundary transaction types. Transaction types T15 and T16 concern the calculation of offers and orders. In the company, the actual calculation of offers and orders is performed by the same person. The transactions T14 and T25 are both periodic checking operations. T14 is initiated and executed by the actor A1.6 Check-Payment and checks the customer payments against the conditions for the payment as agreed upon in the order contract. T25 concerns a periodic check of the stock. The transactions T18, T19, and T20 are self-activated transaction types that are all concerned with the detail planning in the company. T17 involves the overall (rough) planning and determines the time limits, per order, for the different departments in the company. Transactions T18, T19, and T20 elaborate in detail on the overall planning. These detail plannings concern a usability schema of people and material at the departments. The planning is also essential as a justification of the hiring of extra personnel at the production and assembly departments. The results of the planning transactions form the basis for the
transactions T21, T22, and T23 by which the actual work at the three departments is initiated. Finally, transaction T24 is identified and represents the normal, internal, shipping facility.

Figure 5.2 presents the transaction types and their initiating and executing actors by means of the CD. Because of the size of the study it is impossible to present the complete interaction and interstriction structure in one graphical model, like which was shown in the previous analysis. Therefore, partial models displaying the interaction and the interstriction structure are introduced. The partial models center around executing actors.

Before I elaborate on some of the partial models in the field study, the DEMO process model is presented. The PM of the field study provides a good understanding of the time sequence of the transaction types in the Profiles Company (see figure 5.3). From the ASD, it is observed that transaction T2 is the central transaction type in the company. Most of the other transaction types are started during the execution phase of this transaction type. The activities of the company are more or less ordered in a sequential manner. However, the transaction type by which the customer is requested to pay for the order is executed parallel to the order delivery. Especially in costly projects, the payments are requested in terms. The first term, the deposit, may start as soon as the Profiles Company accepts an order from a customer.

The ASD of the Profiles Company excludes the ‘pay transactions’ T5, T8, T11, and T13. These transaction types, originating from external actors, are excluded because the behavioral rules for the companies establishing one external actor in the CM differ too much to generalize.

The large amount of fact types and transaction types impel the use of partial models of the field study. In the remaining part of this section I will present the partial models of the transaction types: T2:Deliver_order, T22:Producing, and T24:Shipping. A detailed understanding of T2 because it forms the most important transaction type in the business process of the Profiles Company. T22 and T24 are explained in more detail because they constitute the transaction types in which the communication is examined in detail in section 5.3.

The most important transaction type in the field study is T2:Deliver_order. This transaction type between A0.2 Customer and A1.2 Order-Acceptance forms the point of departure for almost the entire business process. The actors and the transaction type have been described in the transaction table (table 5.2). The fact types of which instances are created as a result of the successful execution of a transaction process of the transaction type T2, and also the data types that restrict the playing ground of the actors involved, are displayed in the Data/Facta table 5.3.

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1 A complete Data/Facta table of the Profiles Company describing both the interaction and interstriction structure is presented in Appendix A.
Together with the transaction table, the Data/Facta table allows the drawing of a partial CD of the actor A1.2 (see figure 5.4). The system boundary that is used in the

Figure 5.3 The Action Sequence Diagram of the Profiles Company

partial CD’s is related to the system boundary of the entire Profiles Company that is displayed in the figure 5.2. This means that the banks and the actors that are placed
outside the system boundary in the partial models correspond to the banks and actors outside the system boundary in figure 5.2, and thus belong to the environment of the Profiles Company. Within the system boundary of the partial models, a relevant part of the internal structure is displayed, and the facts banks of the informative conversations of the actor are presented. The numbers of the banks correspond to the numbering used in the overall CD of the Profiles Company.

<table>
<thead>
<tr>
<th>Actor</th>
<th>Fact Type</th>
<th>Data/Facta</th>
<th>Resides In</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1.2 Order-Acceptance</td>
<td>1 offer-customer</td>
<td>D</td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>7 offer-project</td>
<td>D</td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>8 offer-amount</td>
<td>D</td>
<td>T1</td>
</tr>
<tr>
<td></td>
<td>9 customer-reliability</td>
<td>D</td>
<td>E1</td>
</tr>
<tr>
<td></td>
<td>10 order-delivery date</td>
<td>F</td>
<td>T2</td>
</tr>
<tr>
<td></td>
<td>11 calculated-order-amount</td>
<td>D</td>
<td>T16</td>
</tr>
<tr>
<td></td>
<td>12 order-amount</td>
<td>F</td>
<td>T2</td>
</tr>
<tr>
<td></td>
<td>13 order-agreed delivery date</td>
<td>F</td>
<td>T2</td>
</tr>
<tr>
<td></td>
<td>14 order-customer</td>
<td>F</td>
<td>T2</td>
</tr>
<tr>
<td></td>
<td>15 order-project</td>
<td>F</td>
<td>T2</td>
</tr>
<tr>
<td></td>
<td>16 order-proposed delivery date</td>
<td>D</td>
<td>E1</td>
</tr>
<tr>
<td></td>
<td>17 order-payment terms</td>
<td>F</td>
<td>T2</td>
</tr>
</tbody>
</table>

Table 5.3 Data/Facta table of the actor A1.2 Order-Acceptance

Figure 5.4 Partial CD of the Profiles Company representing the actor A1.2 Order-Acceptance as executor of the transaction T2: Deliver_order.

Figure 5.4 shows that transaction type T2 is started by actor A0.2 Customer. Before the actor A1.2 accepts the order he checks the banks that contain credit information about the reliability of the customer (E1), information about the offer that has been made to the customer (T1), information about the requested material (feasibility check), and the calculation that has been made of the requested order of the customer (T16). These informative conversations are displayed in figure 5.4 The

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2 The fact types are numbered on the basis of the entire FM of the field study as presented in (Reijswoud, Rijst, 1994) and the Data/Facta table presented in Appendix A.
result of the transaction is the creation of several fact types. These newly created fact types have been summarized in table 5.3.

The partial CD is accompanied by a partial FD. Since the FD only concerns the graphical representation of one transaction type, it allows to display the distinction between facts and data. In the partial FD, the roles of the facts are gray-colored. Figure 5.5 shows the accompanying FD displaying the data types and the facta types that are used and created in transaction type T2.

Figure 5.5 Partial FD of the Profiles Company representing the actor A1.2 Order-Acceptance as executor of the transaction T2:Deliver_order.

<table>
<thead>
<tr>
<th>Actor</th>
<th>Fact Type</th>
<th>Data/Facta</th>
<th>Resides In</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1.15 Produce</td>
<td>15 order-project</td>
<td>D</td>
<td>T2</td>
</tr>
<tr>
<td></td>
<td>21 accessory-delivery date</td>
<td>D</td>
<td>T6</td>
</tr>
<tr>
<td></td>
<td>33 enameled-profile-delivered</td>
<td>D</td>
<td>T7</td>
</tr>
<tr>
<td></td>
<td>35 accessorySpecifications</td>
<td>D</td>
<td>E2</td>
</tr>
<tr>
<td></td>
<td>36 glass Specifications</td>
<td>D</td>
<td>E2</td>
</tr>
<tr>
<td></td>
<td>37 profile Specifications</td>
<td>D</td>
<td>E2</td>
</tr>
<tr>
<td></td>
<td>53 week specifications</td>
<td>D</td>
<td>T19</td>
</tr>
<tr>
<td></td>
<td>65 order-drawing</td>
<td>D</td>
<td>T21</td>
</tr>
<tr>
<td></td>
<td>56 order-production date</td>
<td>F</td>
<td>T22</td>
</tr>
</tbody>
</table>

Table 5.4 Data/Facta table of the actor A1.15 Produce
A transaction type of which the constituting transaction processes are considered in
the next section concerns the actual production of profiles into window frames at
the shop floor (T22:Producing). The production is initiated by A1.9 Plan-Production
and executed by the A1.15 Produce. Table 5.4 presents the facts and data types of
transaction T22. The actor Produce is called a data-intensive actor, because it needs
much data to produce a limited amount of fact types (see: figure 5.6). For the actual
production of profiles it needs information from the external bank E2 (technical
details for the proper use of the profiles, glass, and accessories), a description of the
order as agreed upon in T2 and the drawings as prepared in T21, the delivery dates of
the enameled profiles (T7) and the other material (T6), and the detailed
production planning (T19). The fact that is created, as result of the successful
completion of the transaction, is the production date of the profiles. The FD is
presented in figure 5.7.

Figure 5.6 Partial CD of the Profiles Company representing the actor A1.15 Produce as
executor of the transaction T22:Producing.

Figure 5.7 Partial FD of the Profiles Company representing the actor A1.15 Produce as
executor of the transaction T22:Producing.
The last transaction type that is considered in more detail is T24:Shipping. The transaction type represents the, so-called, internal shipping of profiles to the building site. The transaction type is initiated by actor A1.9 Plan-Production and executed by the actor A1.18 Ship. The transaction involves little data and there is only one fact created as result of the successful completion of the transaction. Table 5.5 presents the partial Data/Facta table, figure 5.8 the partial CD, and the partial FD is displayed in figure 5.9.

<table>
<thead>
<tr>
<th>Actor</th>
<th>Fact Type</th>
<th>Data/Facta</th>
<th>Resides In</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1.18 Ship</td>
<td>14 order-customer</td>
<td>D</td>
<td>T2</td>
</tr>
<tr>
<td></td>
<td>56 order-production date</td>
<td>D</td>
<td>T22</td>
</tr>
<tr>
<td></td>
<td>58 order-shipping date</td>
<td>F</td>
<td>T24</td>
</tr>
</tbody>
</table>

Table 5.5 Data/Facta table of the actor A1.18 Ship

Figure 5.8 Partial CD of the Profiles Company representing the actor A1.18 Ship as executor of the transaction T24:Shipping.

Figure 5.9 Partial FD of the Profiles Company representing the actor A1.18 Ship as executor of the transaction T24:Shipping

The transaction processes which constitute the transaction types that have been highlighted in this section are analyzed with the TPM. The next section reports on this analysis.
5.3 Analyzing transaction processes with the TPM

In the previous field study, where the transaction processes at the scheduler’s office were analyzed, I showed that face-to-face transaction processes could easily be parsed onto the TPM on the basis of turn-taking. The resulting TPD’s provided an improved understanding of the different possible courses of transaction processes. At the same time, the face-to-face communication orientedness of the research design limited the findings of this study. Implicit transaction processes were identified, but a conclusive explanation clarifying the structure of these transaction processes could not be provided. Due to the limited scope of the first research, I also have not been able to observe communication at the discourse-layer of the TPM. These limitations of the first study resulted in the need to conduct a second study in which these missing observations had to be addressed, in order to strengthen the understanding of the relation between the theoretical TPM and the actual communication in an organization.

The current section in which the application of the TPM is continued, needs to be understood in conjunction with the findings in paragraph 4.2.3. This implies that I will not further elaborate on explicit transaction processes, but elaborate in more detail on implicit transaction processes.

The major difference between the first and the second field study is the inclusion in the transaction process analysis of the documents that circulate through an organization. The documents that are in use in the Profiles Company are categorized in two groups: standardized forms, and reports. Standardized forms are forms that contain the necessary headings and only need to be completed by the user of the form. These forms play an important role in the Profiles Company. The management of the Profiles Company takes the view that standardization of communication processes, where possible, increases the effectiveness and efficiency of the production process. Considering the level of detail that is required in the production of window frames, this view seems to be justified. The major consequence of this view is that the coordination of activities between the different departments in the production process, as well as between the Profiles Company and its environment, often take place via standardized forms. Reports are free-form documents that provide an account of the agreements that have been reached during meetings. These meetings may be scheduled or ad hoc. The meetings in the Profiles Company are mostly scheduled and are used to evaluate the progress of the orders that are being produced at that particular moment in time. Once a week, there is a scheduled meeting between the managing director of the company and the representatives of all departments. There are also scheduled meetings between the different departments to evaluate and tune the different departmental activities within the projects at hand.

Documents of both categories of meetings were analyzed in addition to the analysis of the face-to-face communication as explained before. The analysis of these documents did not cause many problems because the majority of the information in the standardized forms and reports is categorized on the basis of an order number (every order that is accepted receives an unique order number).
The next section starts with an examination of the communication process structure of some of the meetings that take place in the Profile Company and their function in the entire business process. The meetings are an important source of data for the understanding of both implicit transaction processes and discourses. Based on this examination I then further elaborate on implicit transaction processes. Finally, transaction processes that develop through the discourse-layer of the TPM are considered.

5.3.1 Meetings

Meetings form an integral part of the activities in an organization. The amount of time spent on meetings differs between offices and production plants, but also between blue and white collar workers. For the managers in an organization, the time spend on face-to-face communication in scheduled meetings has reported to be up to 59% (Mintzberg, 1973). Other studies report on more or less the same percentages (Kurke, Aldrich, 1983; Christie, 1981; Stewart, 1967). The General Manager at the Profiles Company estimates that he spends about 30% of his time on scheduled meetings. He is unable to estimate the time he spends in total on face-to-face communication, but he confirmed the importance of meetings and face-to-face communication for the coordination of the activities in the company.

The meetings in the Profiles Company have an important function in the monitoring of the business process. Because of the relatively flat organizational structure of the Profiles Company, this monitoring is performed at two levels. At the highest level, the company level, the different departments discuss the progress of the orders at hand. The terminology that is used in these meetings is characterized as being general. This means that there are no detailed discussions about ins and outs of the production process. At the second level, the departmental level, the progress of the completion of phases in the order production process are discussed. The terminology that is used in these meetings is characterized as being detailed. The production of the orders is discussed with a high level of technical detail. In the Profiles Company, the so-called General Progress Meeting is the representative of the first level, while the second level is represented by the so-called Order Progress Meetings held at every department. Next to the monitoring of the business process, the meetings are used to solve managerial problems. This last purpose of the meetings is discussed in more detail in paragraph 5.3.3. In the current paragraph the focus is on the (dominant) business monitoring function of meetings.

Although the DEMO approach does not consider meetings, the concepts ‘interaction’ and ‘interstriction’ can be used to achieve a better understanding of the face-to-face communication during a meeting. This means that some communication acts relate to the initiation or conclusion of transactions, while other communication acts are clearly used to retrieve or provide information necessary in the carrying through of a particular transaction process. With regard to the TPM, this implies that meetings can be analyzed in terms of CA’s, transaction states, and information providing CA’s. The subsequent part of this paragraph illustrates, with some conversation extracts from meetings at the Profile Company,
the relation between face-to-face communication in meetings and the TPM. I will first examine the General Progress Meeting, and then continue with extracts from the meetings at the departmental level.

The analysis of the communication that is observed at the General Progress Meeting, reveals that most of the CA's concern the exchange of information about the progress of a particular order in the company. This information is exchanged between the representatives of the different departments. E.g., the conversation between Sales (Sa) and the general manager (GM) in the General Progress Meeting:

[...]
CA1 GM: "What about the offer to DoubleDeck. Do you reckon, is there a chance that we get the order?"
CA2 Sa: "I have called with a friend of mine at DoubleDeck, and I think we have a very good chance to get the order."
[...]

or the conversation between the Plan-Production (PP) and Purchase (Pu),
[...]
CA1 PP: "Do you expect the enameled profiles for the REBO project to arrive on Monday or on Thursday?"
CA2 Pu: "I have agreed that the profiles are delivered on Thursday morning."
[...]

With particular reference to the last example we clearly see an information providing conversation between the actors A1.9 Plan-Production and A1.12 about a specific transaction process in the transaction T6:Delivering_supplier_order. Plan-Production needs the information about the delivery of profiles for the week planning of the production hall; namely, as soon as the profiles arrive, the production of the profiles can be started. In the DEMO communication model this retrieval of information, in relation to the transaction type T19, is represented as follows (figure 5.10).

Figure 5.10 Informative conversation from A1.9 Plan-Production with the bank T6, as part of transaction type T19
If the same communication is modeled with the TPM, the information providing extension that I have presented in the previous chapter has to be applied. The information providing extension reflects the retrieval of the information that is needed for the actual week planning of the production hall. From the conversation it may be assumed that Production-Planning is busy retrieving the information for the production of the week planning, and in this context he needs to know whether he can plan the start of the production of the particular order on Monday or Thursday. Therefore, in conceptual terms, the transaction bank is consulted in the transaction state 2 (see figure 5.11). Since the example conversation only concerns a small part of a longer conversation, the foregoing CA is labeled \( CA_n \). The CA's concerning the information providing conversation have been placed next to the dotted line connecting the transaction state with the information bank.

![Diagram of TPD](image)

Figure 5.11 Part of a TPD representing an informative exchange of CA's

Although information providing communication seems to be dominant in the General Progress Meeting, action initiating (actagenic conversation) and action reporting communication (factagenic conversation) was also observed. The following example illustrates a request for action by Sales (Sa) to Calculation (Ca):

CA1   Sa:  (Addressing Ca)

"Since there is a good chance that we will get the DoubleDeck order, it may be a good idea to complete a detailed calculation of the project, including the margins of profit."

CA2   Ca:  "There is one more calculation that I have to complete tomorrow, but then I will prepare a detailed calculation for the DoubleDeck order."

In this conversation we observe a request to prepare a calculation of a particular project. In the DEMO analysis of the Profiles Company, this conversation would be uttered in the context of the transaction type T15:Calculating_offer_costs.

The Order Progress Meetings shows the same conversational diversity, but these meetings differ in the fact that the focus is not on different transaction types, but on the transaction states of different transaction processes of the same type. The conversations in these meetings also show more detail. A typical illustration is the conversation between head of the production department (HP) and one of the production employees in charge of the coordination of production process at the shop floor (P) in Order Progress Meeting at the production department.
 [...] 

CA1 HP: “Can the order 94004 be produced on Wednesday 17th by production group 2?”

CA2 P: “Yes, but only if the construction of DK35 profiles in order 93544 is causing no more problems.”

[...]

The reports, or minutes, that are created as a result of the meetings have an important function in the communication in the organization, because they contain a written account of the commitments that have been made. In these reports promises to perform a certain action were observed,

The calculation department completes the calculation of the order 94078 on March 16th

but also the initiation of new transaction processes.

The production planner will hire 3 extra men for the production during the summer months

Minutes may also contain important information that has been provided during the meeting. This information can be recognized because it is normally stated in the following format:

On the question of person x, person y reports that ......

The meetings, as well as the reports and minutes produced as a result of these meetings, play an important role in the understanding of the transaction processes that take place at the Profiles Company. Therefore, in the remaining part of the chapter, this information is considered as research data in conjunction with the observed face-to-face communication.

5.3.2 Implicit transaction processes revisited

The analysis of face-to-face communication alone did not provide a satisfactory answer to the structure of communication used in the first field study, and resulted in the identification of, so-called, implicit transaction processes. The current paragraph not only re-considers the structure of these transaction processes, but also extends the analysis with research data that is elicited from the analysis of the documents that are used in the Profiles Company. To illustrate the structure underlying implicit transaction processes, this paragraph starts with the examination of an explicit transaction process that is transformed in an implicit transaction process. A side effect of this example is that it explains the importance of documents in transaction processes. The role of standardized forms in the transaction processes between the Profiles Company and its environment is also highlighted by means of a second example that is explained in this paragraph.

The transaction process that is analyzed in detail belongs to the transaction type T22:Producing, involving the actual production of the profiles into window frames in the production hall. This transaction type is the most visible transaction in the
Profiles Company, and is also one of the most dependent transaction types because it relies heavily on the availability of material. In the previous paragraph I have presented the partial CM and FM of this transaction type. Its function in the entire business process of the Profiles Company can be determined from the overall CD (figure 5.2) and the ASD (figure 5.3).

The production involves three intermediate steps. First the profiles are sawn to the right size, then the profiles are bored and milled when necessary, and finally the different parts are produced into a window frames that can be assembled by one of the assembly teams. The production is finished, when the end-product is ready to be shipped to the building site for the assembly. The technical details needed for these technical operations on the profiles are supplied by the actor A1.14 (Draw) as part of the drawing of the order (T21:Drawing) and by the order description (T2:Deliver_order).

At the time that the field study was performed, the interaction between the actor A1.9 Plan-Production (the initiator of the action) and the actor A1.15 Produce took place face-to-face. At the beginning of the working day, actor Plan-Production initiated transaction processes of the type Producing by giving explicit face-to-face orders to the workers in the production hall. These transaction processes were initiated on the basis of the detail week planning produced in T19:Planning_production. The following conversation could be observed between Planning-Production (PP) and one of the workers in the production hall (P).

CA1 PP: “This morning I would like you to saw the profiles for order 93112. You find the drawings in the order file”

CA2 P: “OK.”

The conversation displays a simple and straightforward example of an actagenic conversation. In CA1 the actor Plan-Production requests actor P to perform a certain action, and in CA2 the actor Produce promises to produce the order. When the formalized notation is used, the following structure of the CA’s appears:

CA1 PP: C [request action(directive)<order with order# 93112 is sawn conform drawing, before today 1200 hours>]

CA2 P: C [promise(commissive)<order with order# 93112 is sawn conform drawing, before today 1200 hours>]

After the production worker had finished the requested sawing of the profiles, he returned to the office of the actor A1.9 Plan-Production to report the completion of the order, and to receive a new request for action. Except for some occasional problems, most of the transaction processes of this type proceeded only along the success-layer of the TPM.

When the Profiles Company was visited again one year later, the communication medium concerning the production of profiles was about to change dramatically. In the new situation we hardly observed any face-to-face communication. Most of

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3 These dramatic changes, however, do not change the communication model of the Profiles Company, because they concern changes at the documental level of the organization.
the requests to produce an order are now communicated via weekly schedules. These schedule are produced in the transaction T19:Plan_production, and indicate which order has to be produced, by whom, and on what day the order has to be completed. This last data type is retrieved from the overall schedule (T17). The orders mentioned on this schedule are accompanied by a file that contains all the detailed technical information regarding the order. Only in special cases, the production team is asked explicitly whether a certain order can be produced or not. This usually involves small express orders.

The request to produce a certain order is communicated to the workers on the shop floor via a pinned up schedule in the production hall. The schedule identifies the three different activities that are needed for the production of a certain order of window frames, and assigns days and groups of workers to the tasks. The Profiles Company possesses two production lines, and so there are always two groups at the time to produce an order. The preparatory treatment of the profiles is normally performed by only one group, but in busy periods two groups are set to work. An example of the schedules that are used is presented in figure 5.12. The schedule is accompanied by order files containing the technical drawings, the technical specifications of the material, and special order-specific information that is needed for the production of the profiles.

<table>
<thead>
<tr>
<th>Production planning week: 18</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sawing</strong></td>
<td><strong>Preparatory treatment</strong></td>
</tr>
<tr>
<td><strong>Monday</strong></td>
<td>94104-group S1</td>
</tr>
<tr>
<td></td>
<td>95003-group S2</td>
</tr>
<tr>
<td><strong>Tuesday</strong></td>
<td>94355-group S1</td>
</tr>
<tr>
<td></td>
<td>95003-group S2</td>
</tr>
<tr>
<td><strong>Wednesday</strong></td>
<td>94355-group S1</td>
</tr>
<tr>
<td></td>
<td>95003-group S2</td>
</tr>
<tr>
<td><strong>Thursday</strong></td>
<td>...</td>
</tr>
<tr>
<td><strong>Friday</strong></td>
<td>...</td>
</tr>
</tbody>
</table>

Figure 5.12 An example of a week planning for the order production in the production hall of the Profiles Company
Although the transaction processes in both the old and the new situation are communicated in a completely different manner, there are no fundamental differences between the content of the two processes. The schedule that is used in the new situation, contains similar requests for action than in the old situation. When the formula for CA's is to represent the first cell of the schedule presented in figure 5.12 this similarity becomes visible. The first cell contains the following two requests:

C [request action(directive)<order with order# 94104 is sawn conform drawing, before Monday 1700 hours>]

and

C [request action(directive)<order with order# 95003 is sawn conform drawing, before Monday 1700 hours>]

The initiator of the transaction process is known, namely A1.9 Plan-Production. According to the DEMO CM, the executor of the transaction process is the actor Production. However, when the content of the first cell of the production schedule is considered, we observe that the request for action is addressed to the sawing groups S1 and S2. These two groups need to be considered as two groups that both fulfill part of the actor role Production.

If the transaction process is initiated via a production planning schedule, there appears no explicit promise from the executor to execute the requested action. To overcome this problem, the introduction of the new situation is accompanied by some organizational rules concerning this aspect. For example, it has been agreed upon with the people involved in the order production, that the schedule assumes that a promise to perform the scheduled objective action is expected automatically, unless there is a contra-indication for such a promise. In this case the person or the group involved in the actual production (executor) needs to contact the initiator of the transaction process (A1.9 Plan-Production). The continuation of the transaction process is regulated with a similar rule stating that in case of problems the initiator needs to be contacted. In chapter 3 rules of this kind were labeled explicit informal norms or explicit formal norms, depending on whether they are officially documented. Transaction processes regulated by such norms seem to develop without problems.

A second example of implicit transaction processes involving standardized documents is observed in the interaction between the Profiles Company and its environment. The transaction type (T6:Delivering_supplier_order) concerning the ordering of material from the suppliers provides a good illustration of the course of these implicit transaction processes. The delivery of supplies concerns a broad range of material; from different brands of profiles to all kinds of hinges and locks. These materials are ordered from a broad variety of suppliers. The materials have different delivery periods, but these are known to the responsible purchaser. Every item that can be ordered from a supplier has an unique item number. This number is determined by the supplier. The delivery periods and the item numbers of the materials are retrieved by the purchaser from the supplier's catalog. When the purchaser orders an item from a supplier, he has to mention the item number and
the amount desired. This information needs to be mentioned on a special standardized order form, that is sent to the supplier. In the normal situation, a request of this kind results in the delivery of the materials at the Profiles Company, where the purchaser checks the delivery for rightness and completeness.

A transaction process of the transaction type T6:Delivering_supplier_order is performed without face-to-face interaction. This means that the ordering procedure can only be understood when the standardized forms are also considered. But even then, if the interaction is mapped onto the TPM an incomplete TPD appears (figure 5.13). The standardized ordering form containing the items represented by their item numbers and the desired amounts is represented by CA1. Therewith the actor A1.12 Purchase starts the transaction process T6:Delivering_supplier_order. When the order form is sent to the supplier (CA1), no explicit promise by the supplier to deliver the materials is performed. The course of the transaction becomes visible again when the order is delivered at the Profiles Company. The delivery of the order is represented by CA2 in the TPD. The checking of the correctness and the completeness of the delivered order, and the resulting acceptance is represented by CA3. The transaction state 2 and objective action are covered with a gray shaded box to express the implicitness of the commitment to deliver the order and the execution of the ordering request.

![Figure 5.13 A TPD of an implicit transaction process of the type T6:Delivering_supplier_order](image)

If the employee representing the actor Purchase is asked for an explanation about the lacking of the commissive CA, he explains that the use of standardized ordering forms in conjunction with good rules, provides enough guarantee about the execution of the action so that an explicit promise is not needed. The headings of the standardized ordering form force the purchaser to complete in such a manner that all information needed for an unproblematic delivery of supplies is included. In addition to the standardized form there exists an agreement with the supplier that he will respond only when, for any reason, there are problems with the delivery of one or more of the items as requested on the form.

The hidden phases in implicit transaction processes become visible in case of problems (breakdown). If, for example, one of the requested items is out of stock, the supplier will call the actor Purchase at the Profiles Company to inform him that he cannot commit himself to the requested delivery. The purpose of this telephone call is to initiate a cancellation of the current transaction process or to agree on a new request for action.

Figure 5.14 shows TPD's of 4 possible courses of transaction processes in the transaction type T6. In TPD (1) the transaction process is canceled after the supplier informed the purchaser about some problems with the delivery of material. In (2) a
problem results in a reformulation of the proposition after a discussion. In TPD (3) a delivery problem occurs during the execution of the request. This situation can be observed more often in T7:Enameling_profiles, when one of the machines breaks down. In situation (4) the result of the execution is not satisfactory and after a discussion the transaction process is canceled. In all four situations transaction processes that are normally implicit are made explicit.

Figure 5.14 Possible courses of the transaction process in case of breakdown

From the two examples examined in this paragraph it is concluded that the implicit transaction processes are not considered to be problematic. Although the first kind of implicit transaction processes is unique to the business process in the Profiles Company, the second kind applies to almost all transaction processes with external actors. The actors from the Profiles Company involved in implicit transaction processes state that missing elements are not problematic on the condition that there exists explicit formal or explicit informal rules regulating the behavior of the participants. This means that implicit transaction processes are always accompanied by a set of explicit formal or informal rules that need to be known to both actors involved in the transaction process.

In the previous chapters I have examined the rules underlying transaction processes and hypothesized that they result from discourses. The next paragraph expands on transaction processes that evolve into the discourse-layer of the TPM.
5.3.3 The use of the discourse-layer

In the first study I have not been able to observe a discussion about validity claims in a communicative oriented transaction process that was continued at the discourse-layer of the TPM. When the field study at the Profiles Company was initiated, special attention was paid to identify communication at the discourse-layer of the TPM.

In the previous chapters I have explained that discussions about validity claims and discourses show an important difference, that make it easy to distinguish them. The difference between these two types of organizational communication concerns the theme. Discussions about validity claims, on the one hand, relate to a particular instance of a transaction type, e.g., the order with the order# 93154. Discourses, on the other hand, abstract from particular instances of a transaction type, and focus on the underlying rules of a particular transaction type. E.g., the rule that every new order in the company gets an order number of five digits, of which the first two digits denote the year of acceptance, while the remaining three digits describe the number of the order.

During the field study, it has proven to be almost impossible to capture conversations in which the transaction process proceeds from the success-layer via a discussion about validity claims in the discussion-layer to a discourse at the discourse-layer of the TPM. Transaction processes that develop in this manner are so rare that a more sophisticated research design would have been needed. Probably, long term recordings at the offices and in the production hall would have resulted in the desired data. However, a research design of that kind was unacceptable to the management of the Profiles Company, because it would bring into discussion the privacy of both the employees and the customers of the company. Therefore a different research design had to be chosen. It has been decided to determine the structure of transaction processes that developed through the discourse-layer of the TPM retrospectively.

An important element of the DEMO analysis of an organization is formed by interviews with representatives of the different departments. Normally, these interviews are used to determine the actors, the interaction and interstriction structure, the time-relationship between the transaction types, etc.. In the search for data to establish a relationship between the theoretical TPM and the role of discourses in the actual business communication, an extra element was added to these interviews. Before the interviews, the representatives were invited to write a short note on the problems with other departments that had been encountered in the last couple of months, as well as the current problems. In consultation with the researcher, the management gave permission to the representatives to respond without restraint. Five from the six representatives responded, only the sales department failed. The exact purpose of these notes was not explained. The actual interviews with the representatives were used to elaborate on the problems that were mentioned in the notice by the interviewee as well as by the problems that were mentioned by his colleagues. Special attention was paid to the arguments that were used by the participants in the discussion, and the way in which the problems
were solved. All the interviews were recorded and transcribed. The information from the interviews was cross-related and categorized in order to get a detailed and as complete as possible picture of the problematic transaction process.

Next to the interviews, the minutes of several meetings were analyzed for new, or changed organizational rules. This activity was guided by the hypothesis that discourses form an important element of the meetings in an organization (see: Chapter 3). A confirmation of this hypothesis was provided by the interviewees who hinted that the General Progress Meeting was generally used for the approval of a new rule in the organization. The minutes of the meetings in the Profiles Company were examined for declarations of new rules. In the minutes these declarations usually appear in the form of “It has been decided that ...”. Confusing in this context is that the declaration of a fact in a successful transaction process or a ‘anti-fact’ in an unsuccessful transaction process can be expressed in the same format (see: section 5.3.1). Therefore the theme of the proposition of the declarative CA was examined as an additional criterion for the selection. If the theme concerned a particular transaction process, the declaration was related to the discussion-layer of the TPM, while a declarative with a theme related to an organizational rule underlying a transaction type was assigned to the discourse-layer of the TPM.

Based on these two sources of data, the remaining part of this section illustrates a reconstruction of the birth and development of a transaction process that proceeds from the success-layer through the discussion-layer to the discourse-layer of the TPM. The reconstruction describes a relatively uncomplicated problem between the actor Ship and Plan-Production about the shipping of profiles to the building site. In the previous section, I have presented the DEMO model of this activity (see: figures 5.8 and 5.9). The problem manifested itself and was also solved during the period the organizational communication in the Profiles Company was observed. The solution of the problem resulted in a modified organizational rule regarding the loading and shipping of profiles.

The shipping of the produced profiles to the building site is normally handled by the actor Ship of the Profiles Company. Only if the profiles are extremely large of size, the shipping is contracted out to an external shipping company. However, in the remaining part of this paragraph I will only consider the internal shipping (T24:Ship). When the profiles have been produced by the actor A1.16 Produce, the actor A1.9 Plan-Production requests the actor A1.18 to ship the profiles to the building site. The actor Ship is supposed to act highly flexible, and therefore the shipping of profiles may be requested on the day previous to the actual shipping. There is only one restriction, if a shipping for the next day is requested, there must be enough time to load the lorry that same day, so that the driver can leave early the next morning.

The reconstructed conversation below illustrates a discussion about validity claims that leads to the initiation of a discourse about new organizational rules concerning the shipping of profiles. The participants in the conversation are the actor Plan-Production (PP) and the actor Ship (S).
CA1 PP: "The profiles for the Bakery project in Geldermalsen are ready to be shipped. I would like you to ship them tomorrow."

CA2 S: "This will be difficult, because the boys are about to leave."

CA3 PP: "But I have already informed Assembly that they can send an assembly team to the building site."

CA4 S: "This is not my fault. It is too late to ask the boys to load the profiles of the Bakery project today. So I suggest that the boys load the profiles tomorrow afternoon and ship them to the building site the day after tomorrow."

CA5 PP: "This is ridiculous! I almost get the impression that you are trying to thwart me. Every time I ask you to ship the next day, you come up with some kind of excuse regarding the loading. I think it is about time to write down some rules regarding the loading and shipping of profiles."

CA6 S: "I'm not trying to thwart you, and I propose to discuss some regulations for the express loading and shipping in the General Progress Meeting."

When the conversation is analyzed, it is observed that there is a shift from the specific to the general. This is an important difference with the transaction processes analyzed before. The transaction process starts with a request for the loading and shipping of the profiles belonging to a particular order (the Bakery Project in Geldermalsen). The actor that is responsible for the shipping replies by implying that he is not in the position to ask the loaders to stay longer to load the order. The claim to justice is at stake. The actor PP adds an extra argument to convince S (CA3), but S is not to be persuaded and impresses upon the alternative (CA4). In CA5 the nature of the transaction process changes, the focus of the transaction process shifts from one particular order to the underlying rules for the handling of the transaction processes belonging to this particular transaction type. The response of S is that he proposes to discuss the rules underlying the transaction type T24:Shipping in the General Progress Meeting.

Figure 5.15 presents the TPD of the course of transaction process.

![Figure 5.15 The TPD of a transaction process that leads to the initiation of a discourse](image)

In section 5.3.1 the General Progress Meeting was already discussed as a means to discuss the progress of orders, but next to the evaluation of the progress, the
participants are also invited to contribute and discuss all kinds of problems that have been encountered in the coordination of the business process. It is this last part of the meeting that is of particular interest to the understanding of organizational communication that proceeds through the discourse-layer of the TPM, because it was at this moment that the organizational rules underlying a transaction type are discussed. In the example conversation the General Progress Meeting is proposed to elaborate on the organizational rules underlying the loading and shipping of the profiles.

During the General Progress Meeting, the problem concerning the shipping of the profiles is put forward by the actor Shipping. Below, the conversation about the shipping of profiles is presented as it was observed during the meeting. The participants in the communication extract from the General Progress Meeting are Ship (S), Plan-Production (PP), and the general manager (GM).

CA1  S:  “The loading and shipping of the profiles is causing some problems. Although we try to act flexible, there are limits to our flexibility. The flexibility is provoked when Production asks at ten minutes to five to load a complete glass wall.”

CA2  PP:  “First of all, I didn’t ask you to load a complete glass wall, they were only the profiles of the Bakery project. But let’s not discuss this particular project, we are having a lot of these problems recently.”

CA3  S:  “OK. The problem is that often I cannot honor a request to load profiles for shipping the next day, because it’s simply requested too late.”

CA4  GM:  “You say ‘too late’, but can you indicate how much time you need to load?”

CA5  S:  “It all depends on the size of the order. Small orders are loaded in 15 minutes, while the loading of a large and fragile order can take up to 2 hours.”

CA6  PP:  “So, if you are asked 2 hours in advance to load the lorry, no matter what the order is, you’ll have time enough to load?”

CA7  S:  “Yes.”

CA8  GM:  “Thus, if we agree that the loading of profiles should be requested before 3 o’clock, you are satisfied?”

CA9  S:  “Yes, I am. But then I’ll no longer load orders when requested after 3 o’clock!”

CA10 PP:  “I think a bit more flexibility is desirable. If I have some profiles for a private person to load after 3 o’clock, then this must be possible.”

CA11 GM:  “I agree [with PP], but it can no longer be a point of discussion. You may ask [S] whether he sees a possibility to load the profiles, but if he says ‘no’ this means that it is ‘no’. No further discussions allowed.”

CA12 PP:  “I understand. I will only use this possibility in special cases.”

CA13 S:  “I can live with the special cases condition. As a whole, it seems a good rule to me. We’ll see how it works out.”
If the conversation is analyzed, it is observed that the conversation is a continuation of the initial discussion above. By means of CA1, S introduces that there is a problem with the shipping of profiles and refers to the discussion in which the problem initially arose. In CA2 PP clarifies that the problem is not related to the specific order mentioned, but relates to the general rules underlying the transaction type T24:Ship. In CA3, the effect of this remark becomes visible, because S highlights the problem in terms of the general rule. The general manager joins the conversation as a facilitator (CA4), and tries to further clarify the problem. After a short exchange of thoughts, a new rule is proposed in CA8, namely “A request for loading profiles has to be made before 3 o’clock”. In the remaining part of the discussion an additional condition is discussed.

![Diagram](image)

Figure 5.16 The analysis of the discourse about the shipping of profiles with Toulmin’s argumentation model

The structure of a discourse is better understood when Toulmin’s model of argumentation is applied. This model of argumentation has been explained in chapter 2. When the argumentation analysis model is applied to the shipping conversation, the following structure is recognized. The claim central to the discourse is that a request to load an order the next day, must be performed before 1500 hours. The data underlying this claim is that it takes a maximum of 2 hours to load an order. The loading of the order needs to be requested before 1500 hours since it must be loaded in working hours (warrant), which are determined by contract to be between 800 and 1700 hours (backing). The structure of the arguments in the discourse is illustrated by means of Toulmin’s model below (figure 5.16).

In chapter 3, I have proposed a Discourse Process Model (DPM) representing the structure of discourses. The structure of the events causing the discourse to proceed from one state to the other, is caused by discourse acts. Discourse acts are elicited from the CA’s in the conversation and the structure of the discourse as presented above. The CA’s are transformed into discourse acts, so that the internal structure of the discourse is highlighted. CA2 is transformed as follows:
DA1 D[request discourse(directive)<(shipping orders are shipped the next day (always)), T24>]

It is observed that the DA's are not directly related to the participants in the discourse, contrary to the CA's at the transactional discussion-layer of the TPM. In DA2, where the content of the new rules is proposed, this becomes most visible. DA2 is based on CA3 - CA9, and is formulated by S, but in interplay with GM and PP.

DA2 D[counter (assertive)<(shipping orders are shipped the next day if requested before 1500 (always)), T24>]

As a response to the proposal in DA2, PP counters by means of CA10, because he prefers a more flexible application of the new organizational rule underlying the transaction T24. He prefers to exclude orders for private persons from the new rule. CA4 is represented as DA as follows:

DA3 D[counter (assertive)<(shipping orders are shipped the next day if requested before 1500, if not for private persons (always)), T24>]

In DA4 the condition is specified in more detail in order to make the rule more flexible. This also means that the qualifier 'always' is changed to 'normally'.

DA4 D[counter (assertive)<(shipping orders are shipped the next day if requested before 1500, unless the order is very small and there is spare time(normally)), T24>]

In CA12, PP confirms the rule (DA5). By means of this affirmation the discourse proceeds to the situation in which it is officially declared as a new organizational rule underlying T24. This represented in DA6.

DA6 D[accept(declarative)<(shipping orders are shipped the next day if requested before 1500, unless the order is very small and there is spare time(normally)), T24>]

The application of the DPM to actual business communication is identical to the application of the TPM. After the communication acts are transformed into discourse act, the discourse acts are parsed onto the DPD. The DPD of the discourse under consideration is displayed below (figure 5.17).

Figure 5.17 The Discourse Process Diagram of the discourse about the shipping of profiles
The structure of the discourse as analyzed above has to understand as to the content of transaction state 11 or 12 in the TPD (see: section 3.3.3). On the basis of the observation analysis of the communication and the minutes in the General Progress Meeting, it can be concluded that there is no other difference in an actagenic and factagenic discourse, than that the new (or modified) rules apply to the actagenic and factagenic part of the transaction.

5.4 Conclusions

The field study at the Profiles Company was initiated to supplement the results of the application of the Transaction Process Model in the first study, that has been reported in the previous chapter. Next to face-to-face communication and explicit transaction processes, the field study focused on the role of documents, in order to achieve a further understanding of implicit transaction processes, and transaction processes that proceed through the discourse-layer of the TPM. Both aspects were not addressed satisfactory in the first study.

The inclusion of documents as research data for the analysis of the business communication provided an extended understanding of the communication structure of transaction processes. The analysis revealed that in many situations documents are used as a replacement for face-to-face communication in transaction processes. I have illustrated this with the use of standardized forms in the ordering of supplies from suppliers. Documents are also used for the initiation of transaction processes in the Profiles Company. I have illustrated this by means of the use of pinned up schedules for the actual production of profiles at the shop floor. Similarly, written communication is the prominent communication mode in all the transactions of type ‘paying’ between the Profiles Company and its environment, and vice versa.

The use of standardized forms as a replacement of face-to-face communication is accompanied by norms. These norms, being either informal implicit, informal explicit or formal explicit, take the role of organizational rules that provide guidelines for the desired behavior of an actor. For example, if the purchaser wants to order material from a supplier, he can perform this ordering by mail if he uses the order numbers from the catalog. When the norms underlying a transaction type are violated, or there is a special situation which causes an actor to deviate from the rules, the transaction processes are normally continued verbally.

By means of examining reconstructed communication processes that aim at establishing new organizational rules, the transitions of the TPM to the discourse process model were examined. The retrospective analysis of reconstructed communication initiating a discourse was chosen as a second choice, because continuous observation and recording of communication was not allowed for confidentiality reasons. Interviewing of the participants involved in the discussions leading to a discourse provided, however, a rich picture that allowed reconstruction of the transaction processes. The meetings in which the discourses take place could be observed, so that the discourse process model could be applied to this communication.
On the basis of the results of the two field studies it is concluded that the TPM, in conjunction with the DEMO approach, provides a general model for the understanding of the structure of organizational communication. After the identification of transactional communication in organizations with the DEMO modeling tools, the structure of the communication constituting these transaction types can be understood with the TPM model. During the analysis of the actual communication in the field studies it became clear, however, that communication providing information that is necessary for the execution of transaction processes needed to be included in the model. This has lead to the introduction of the information providing extension. In compliance with this extension, no conversations were observed in the two field studies that could not be analyzed with the model, provided that both face-to-face and written communication are included in the analysis. This last aspect is in accordance with Taylor's theory on organization stating that organizations can only be understood when both conversation and text are considered in the analysis (Taylor, 1993; Taylor, et al., 1996).

The analysis of the communication in the field studies also revealed that in both studies communicative oriented transaction processes are the dominant mode of communication. Although the workers in both organization recognized the existence of strategic oriented transaction processes, they considered this not to be dominant in their own situation. On the basis of the theoretical examination of organizations and communication in chapter 3 this can only be partially explained. The organic organizational structure of the Profiles Company is an explanatory factor for the dominant communicative coordination of action, but on the basis of the mechanistic characteristics of the organization in which the scheduling office operates, more strategic oriented transaction processes were expected. Since strategic orientation is recognized as a possible mode of communication by the workers in the organizations, I consider there to be no ground for a total rejection of this mode of action coordination in organizational communication. On the basis of the analysis of business communication in both field studies it is hypothesized that organic and mechanistic organizational forms need to be applied to a lower level of organization, e.g., departments. This allows a characterization of the scheduling office as being organic, in a predominantly mechanistic organization.

Although the TPM provides a good means for understanding and modeling of organizational communication, I consider this understanding and modeling not to be a goal per se. In the next two chapters, two other possible application areas for the TPM are discussed. In chapter 7 I will describe the usage of the TPM as a template model for the design of computer mediated communication systems, and in the next chapter I discuss the role and the possibilities of an analysis of business communication with the TPM as a means to detect and optimize malfunctioning communication.
Effectiveness and efficiency are key issues in today's businesses. The increasing competitiveness of the markets, in which business organizations have to operate, demand optimal business performance in terms of effectiveness and efficiency (Huber, Glick, 1993; Huber, 1991; Scott-Morton, 1991). Without an optimal performance, most businesses will not be able to survive (Davenport, 1993; Harrington, 1991). The key question for organizations is how to improve effectiveness and efficiency of the organization without increasing the costs. Possible solutions to this dilemma have been proposed under different names and in different forms. An influential approach to the optimization of effectiveness and efficiency of business performance is founded in quality management thinking. The most recent answer to the optimization of business performance is thought to be found in Business Process Reengineering/Redesign/Innovation (Davenport 1995; 1993; Johnson, 1994; Hammer, Champy, 1993). The last approach is proposed to overcome the weaknesses of the quality management thinking.

The current chapter examines both quality management thinking and the reengineering thinking as possible solutions for the optimization of business processes, and proposes an extension to these solutions. Section 6.1 examines the answers to business performance optimization that been provided by Total Quality Management approaches, and Business Process Reengineering and similar approaches. Section 6.2 is used to create a more detailed understanding of aims
underlying these different approaches, and proposes a methodology that integrates both quality thinking and reengineering thinking. In section 6.3 the role of the TPM as a diagnostic and optimization tool for business communication is located in the business system optimization approach. Its usage is illustrated with two examples from the Profile Company. In section 6.4 conclusions are drawn.

6.1 Optimizing business processes

The ‘discovery’ of the productivity paradox has initiated major publications in BPR. Although the BPR field lacks a commonly accepted definition, the underlying claim, stating that a fundamental re-thinking of business processes is necessary to maintain or regain flexibility and competitiveness of a business and its business processes, is clear (Teng, et al., 1992; Davenport, 1995).

However, the desire for business improvement is not new. A popular management nostrum prior to BPR was quality or continuous process improvement (Davenport, Stoddard, 1994). BPR has been viewed as competitive with quality oriented business improvement. In Hammer and Champy (1993, p. 205) quality oriented approaches are considered to be responsible for culture of incrementalism and the creation of companies with no valor or courage. Before examining this claim, I first elaborate, in some detail, on quality oriented business improvement in the next paragraph.

6.1.1 Quality Thinking/The origin of reengineering thinking

The awareness, in the early 1980’s, of the aggressive presence of the Japanese in the world market for manufactured goods, has launched an increased interest in quality thinking. The Western world recognized that the success with which the Japanese penetrated the world market was founded in the quality of their products. The Japanese conceptualization of quality is mainly founded in the quality thinking expounded in the work of Deming, Juran, and Crosby (Moss, 1996, Flood, 1993).

The quality endeavor of Deming started out in the 1940’s. According to Deming, variability in manufacturing output was the main source for concern in the drive to achieve quality in production. Eradication of the causes of variability would mean greater consistency in the output and an enhancement of the product’s reputation. Deming identified two causes in variability: special and common. Special causes of variability in manufacturing are assigned to individual machines or operators, while common causes are shared by multiple operations and are therefore the business management’s responsibility. Statistical process control charts were introduced to analyze and separate cause of variability. Next to the statistical methods, he developed the PDCA cycle, a systematic approach to problem solving. Herewith

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1 For the moment, I prefer to use the abbreviation BPR to indicate Business Process Reengineering/Redesign/Innovation and related terminology. In section 6.2 the term BPR is defined in more detail.

2 Both Deming’s and Juran’s impressive contribution to the rise of Japanese industry have been awarded the Second Order of the Sacred Treasure by the Emperor of Japan.
Deming work became more human oriented. During the early 1980's, Deming's playes an important role in diagnosing America's industrial problems. This resulted in a core of 'five deadly diseases' that needed to be tackled by industry, and an 'action plan' with methodological principles to cure the diseases. Deming's systematic functional logic provides an insightful way of reasoning about organizations, but his later work is too abstract to be readily put into practice (Flood, 1993).

Like Deming, Joseph M. Juran's early work was technical in nature. Unlike Deming, Juran did not hesitate to emphasize top and middle management's responsibility in achieving quality, and therefore the introduction of quality thinking into an organization must start at the top (Juran, 1980). Juran defines quality thinking in three steps: quality planning, quality control, and quality improvement. Quality planning concerns the definition of quality goals and the plans and resources to meet these goals. Quality control means having a simple feedback structure to evaluate the progress of the quality plan. Quality improvement reports on the results of the quality plan. Important in the work of Juran is the notion of customer. According to Juran, customers are not related to the borders of an organization, but to a particular product. This means that there are internal and external customers whose needs have to be satisfied. Although Juran's contribution to quality thinking is impressive, it is important to note that his emphasis on the driving force of management on quality thinking results in an underestimation of the worker and a rejection of the initiatives that can be generated by the workers of an organization.

Crosby's quality thinking is the most concrete of the three quality gurus. His work is greatly appealing because of its cookbook-like nature. Quality is proposed in terms of a 14-step program for quality improvement, and the program is accompanied by a number of tools that can easily be used (Crosby, 1984). Crosby's quality thinking is strongly oriented toward the human dimension of quality management. As the newcomer to the quality gurus Crosby emphasizes that quality thinking relates to tangible and intangible goods (services).

Although there are more people that may be awarded with the title of quality guru (e.g., Shingo, Ishikawa, Feigenbaum), the work of Deming, Juran, and Crosby illustrates two important aspects of quality thinking that are important in the context of the current research. In the first place there are two main areas of focus; a focus on the technical needs of quality control, and a focus on the human dimension of quality management. Technical needs of prediction and control are catered for largely by statistical and quantitative methods. The methods allow an inspection of the product (tangible or intangible) from the design stage to the end stage. Deming's approach provides an important contribution to technical needs of quality control, while Crosby's approach focuses mainly on the human dimension of quality management. In the second place, two categories of improvement processes are identified; bottom-up and top-down quality improvement. Deming and Crosby both emphasize the importance of the workers for the quality of a product, and both promote the quality improvement to start bottom up. Juran's quality approach promotes to start quality thinking from the top management to the workers. Juran considers quality management to be the main factor in achieving a quality product.
So far I have only described the major exponents of quality thinking, without defining the most important term; quality. On the basis of an examination the definitions of quality in the literature Flood (1993) proposes the following definition of quality, that is adopted in the current research:

*Quality means meeting customers' agreed requirements, formal and informal, at the lowest cost, first time every time.*

In this definition customers are all those to whom products, services, and information are supplied. This means that they may be internal and external to an organization. A product, service, or unit of information is expressed in agreed requirements, this means that there are measurable specifications that are mutually, formally or informally, agreed. By formal agreements Flood means agreements that are established in a business-like manner, i.e. with the use of written contracts. Informal agreements are established through interaction. In the remaining part of the research I will not pursue these terms, because they may be confused with the typology of organizational communication I have introduced in chapter 3. On the basis of the two field studies it may be concluded that there is no real difference between formal and informal agreements other than the use of a document. The different modes are supplemental to each other. ‘At the lowest cost’ means that there is no unnecessary loss or waste in time, effort, or material in the production or delivery of the product or service. The last part of the definition on quality, ‘the first time every time’, is included by Flood to indicate that there needs to be an ideal to meet the agreed requirements, and that products or services that fall below those expectations must not be accepted. In Total Quality Management (TQM) the notion of quality, as described above, is extended to a controlled effort that applies to all members of an organization, at all levels and across all functions.

The fact that quality thinking place customer agreed requirements at the center of its definition makes that it has much ground in common with transaction paradigm as proposed in the DEMO approach. Agreement about objective action is also a central notion in transaction processes. In the actogenic phase of a transaction process, both actors aim at achieving a mutual agreement about the future objective action (tangible or intangible), and in the factagenic phase of a transaction process the actors try to reach a mutual agreement about the result of the executed action. Like the definition of quality, the transaction process may be achieved by all means of verbal communication (written and face-to-face communication). A difference between the transaction paradigm and the quality management thinking is that the transaction paradigm does not focus primarily on the quality conditions ‘at the lowest cost’ and ‘first time every time’. There is, however, no contra-indication to integrate these conditions as elements of a transaction process. A business pursuit of high quality transaction processes may become a business’ policy stretching out at all levels and across all functions in the organization. Section 6.3 further expands on this idea.

Although quality improvement is still widely applied for the optimization of business processes nowadays, there has also been criticisms. In the light of this research, one of the most significant criticisms is that approaches to quality
improvement have little to say about how quality improvement translates or can be translated into organizational design. In other words, the organizational structure is not included as a variable in quality improvement, but as a constant (Flood, 1993). A similar line of critique concerns the change in the quality of the work of individual workers in an organization (Klein, Kraft, 1994). A second important weakness of quality improvement is called the incrementalistic nature of quality thinking (Hammer, Champy 1993). This incrementalism of quality thinking results in the inability to bring about radical new work designs (Davenport, 1995). Reengineering or redesign of an organization or business (BPR) is proposed to provide a solution to these shortcomings.

6.1.2 BPR

In 1990 both Davenport and Short (1990) and Hammer (1990) showed that quality thinking only leads to sub-optimization of organizations. Quality thinking is characterized as a method for paving cow roads, the optimization of the old ways of doing business (Hammer, 1990). By means of speeding up old ways of doing business, the optimization of business processes is not able to address the fundamental performance deficiencies that have grown into an organization. To overcome these deficiencies, there needs to be a fundamental re-think of the processes constituting a business, as Hammer puts it: “Instead of optimizing outdated business processes, we should obliterate them and start over”. Only when a business process is started from scratch, dramatic improvements of quality, costs, and cycle time may be expected (Davenport, 1993; Hammer, Champy, 1993).

Not everyone in the field of BPR promotes the radical changes and starting from scratch as proposed by Davenport and Hammer. An opposite school of thought views it necessary to properly diagnose and document existing malfunctions before devising solutions, and the solutions should be carefully tuned to the situation. Starting from scratch is just one possible way to solve the problems in the business. (E.g., Galliers, 1995; Mesters, Nieuwenhuis, et al., 1995; Teng, et al., 1992; Venkatraman, 1991, Keen, 1991).

The emerging ideas for BPR in the early 1990’s have attracted a lot of attention in the area of informatics (Gerrits, 1993). The reason for this attention is located in the fact that the dramatic improvements in the performance of information technology enable new ideas for business process improvements (Keen, 1991, Venkatraman, 1991). When information technology is used to support old ways of doing business, only a limited benefit from IT is gained. Corporate data bases, communication networks, standardized processing systems etc. allow a radically different, new, (re)design of businesses, resulting in dramatic improvements in quality and costs. Both Hammer (1993) and Keen (1991) provide illustrative case studies of the use of IT in BPR.

Although BPR has been claimed to provide the answer to the failure of quality thinking, they should be considered as being beneficial to each other. Both philosophies (TQM and BPR) are oriented to the optimization of business process performance, but they walk a different route. TQM aims at initiating a continuous
process of improvement, while BPR believes in a one-shot redesign or reengineering of the malfunctioning business process(es). When used in combination, BPR is used to select and replace malfunctioning business processes, while TQM can be used to optimize the remaining processes and monitors the quality in the new or modified processes.

In the current research I prefer to define BPR in a manner that it allows the inclusion of both quality thinking and the radical, one-shot, improvements proposed by the BPR prophets:

*BPR is a complex organizational initiative to accomplish strategy-driven improvement of the business and its constituting business processes (together called the business system) with the aim to achieve and maintain competitive breakthroughs in the business’ quality, flexibility and competitiveness.*

This definition of BPR focuses on the results i.e., breakthroughs in quality, flexibility and competitiveness, and does not prescribe the usage of either one-shot improvements or continuous improvement. However, it assumes that these breakthroughs in a business system can only be obtained through a strategy, this means a process consisting of solid diagnosis, implementation and evaluation aiming at continuous monitoring and adaptation of the business system.

Since there are many different ideas and names in the area of BPR (the definition introduced above does not intend to provide an answer to this confusion), the next section proposes a rigorous understanding and terminology for business system improvement based on the DEMO approach. This understanding is integrated in a methodology for business system improvement.

6.2 DEMO and Business system improvement

The DEMO method, as introduced throughout this research (See: chapters 3 and 4), allows discrimination between the different organizational optimization activities mentioned under the umbrella of BPR (Dietz, 1994b). The resulting definition of business system improvement activities provides a better understanding of the nature of these activities. The possibility to distinguish distinct types of business process improvement is based on the identification of three levels of abstraction for studying organizational activities.

The field of informatics provides a well-known distinction in levels of abstraction based on the identification of document related and information related organizational activities. The A and I schemata in the ISAC approach (Lundeberg, et al., 1981) provide an illustrative example of this practice. Along the lines of these thoughts the DEMO approach views an organization at the *documental* level as a system of actors that produce, store, transport, and destroy documents. An example of a documental activity is the sending of some kind of document by mail. At the *informational* level one abstracts from the substance (i.e., document) and focuses on the actual meaning of information. What is observed now is an organization as a system of actors that send and receive information, and perform calculations on this information in order to create derived information. The calculation of the yearly
profit of an organization is a good example of an informational activity. In (Dietz, 1994a; 1992) these two levels of abstraction are extended with a, so-called, essential level. At the essential level an organization is conceptualized as a system of actors that are engaged in the execution of transactions. The transaction paradigm has been explained in detail in the chapters 3.

With the use of these three levels of abstraction, the DEMO approach defines BPR into three distinct activities: business system redefinition, business system redesign, and business system reengineering together establishing Business’ System Improvement. Figure 6.1 illustrates the three different activities of Business System Improvement in relation to the three levels of abstraction as identified in the DEMO approach, and below these activities are explained in more detail.

Figure 6.1 Characterization of BPR activities by DEMO

- **Business system redefinition** is the most dramatic form of BPR because it concerns a change of the core (in DEMO terms, essential) business processes. Redefinition aims at a fundamental reconsidering of the necessity of the transaction types that constitute the core of the business, and results in the addition and/or removal of transaction types. For the DEMO model of an organization this means that the global interaction model is changed, and as a result all the other models defined in DEMO.
• **Business system redesign** focuses on a change of the time dependencies between the different transaction types constituting the core business process. This means that the primary focus of change is on the DEMO process model. Changes in the process model will not affect the communication model, but changes to the remaining DEMO models are inevitable.

• **Business system reengineering** concerns the changing of the realization of the core business processes at the informational and documental levels in an organization. This implies that changes are made to the manner in which the actors in an organization produce, store, transport, and destroy documents and information related to the transaction types. Business system reengineering may include information systems redesign and information systems reengineering. **Information system redesign** covers the generation of alternative informational models of the organization and the replacing of the existing model by one of the alternatives. Information system redesign is based on the conceptualization of an organization at the essential level, but it will not affect the organization at the essential level. **Information system reengineering** concerns the changing of the organization at the documental level. Information system reengineering starts from the informational conceptualization of the organization.

In the remaining part of the chapter, the abbreviation BPR is used as a generic form denoting the entire range of activities for business improvement. When I focus on specific activities, the terminology as described above are used.

### 6.2.1 Business System Improvement Life Cycle

There is a growing pile of publications on BPR approaches propagating a wide range of possible supporting methodologies and techniques. These methodologies and techniques vary from general guidelines for reengineering based on case studies (E.g., Hammer, 1990; 1993), or customer-tailored methodologies developed by major consulting firms (Kettinger, et al., 1995).

The common denominator in BPR approaches’ methodologies proceeds through a project life cycle (E.g., Davenport, 1993):

- articulation of a strategic vision;
- development of a BPR plan;
- establishment of appropriate performance measures;
- implementation of the improved process and organizational systems.

Within this life cycle, aspects of the approaches may differ. According to Kettinger, et al., (1995) the approaches differ in three points. The first point concerns the extent to which a BPR approach focuses on redesigning a new process. Second, approaches differ in the inclusion and sequence of detailed steps. Finally, the specific techniques applied in the approach. This last point is closely related to the preceding points.

In the preceding paragraph I have decided on a definition of BPR that focuses on continuous and radical business system improvement. This means that BPR has to be embedded in a methodology that supports both philosophies. The Process
Reengineering Life Cycle Methodology (Kettinger, et al, 1995) provides a good foundation for the development of a methodology for business system improvement. Consistent with a process management life cycle view, the Process Reengineering Life Cycle Methodology ties BPR's radical process change objectives with other process management activities including quality oriented process improvement. A shortcoming of the Process Reengineering Life Cycle Methodology is that it does not provide a clear definition of the activities constituting BPR. Therefore the stages that constitute the Process Reengineering Life Cycle Methodology are combined with the activities constituting business system improvement that were previously identified by the DEMO approach.

The Business System Improvement Life Cycle (BSILC) is divided into six stages that capture the procedural, human, communicational, technological and the socio-technical dimensions of a business process. The BSILC proceeds through the stages: envisioning, inaugurating, diagnosing, improving, (re)constructing, and evaluating. The stages of the Business System Improvement Life Cycle and their sequence are illustrated graphically in figure 6.2, and are explained below.

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**Envision:** The aim of this stage is to secure management commitment and to reveal business system improvement opportunities. The stage requires the selection of a business process to be improved, and the definition of the project scope. Competitive Analysis and Value Chain Analysis (Porter, Millar, 1985) are considered to be examples of a technique for the identification of possible competitive advantages, further techniques that may be utilized in this stage are discussed in (Kettinger, et al., 1995). The DEMO approach is used for the identification of an organization's core business processes. In particular, the Communication Model provides a good means for a high level representation of the processes that constitute the business system. From a DEMO perspective, it is important to decide on the level of business system improvement (i.e., redefinition, redesign, or reengineering of the business system) that is aimed at in the improvement project.
Inaugurate: Since Business System Improvement initiates significant organizational change, the inaugurate stage aims at the careful launching of the improvement project and encompasses the assignment of working teams and champions, the setting of performance goals, project planning, and stakeholder/employee communication. It is important to note that the more dramatic the proposed form of business system improvement, the more careful the project has to be launched.

Diagnose: The aim of the diagnosing stage is the uncovering of pathologies in the existing business system by carefully analyzing and documenting them. Although Kettinger et al. (1995) skip this stage in the case of a starting from scratch improvement project, I believe that this is a mistake. A careful documentation and diagnosis of an organization’s business processes and their possible mutual relationships provides a necessary background for the improvement stage (supportive and affected business processes), and uncovers second order pathologies (i.e., a pathology outside the selected business process(es), but that exists as a result in relation to the selected process(es) in the project). An extended DEMO analysis, i.e., a Communication Model, a Facts Model, Action Model, and Process Model, forms a solid documentation technique for this stage of the BSILC. Further techniques that may be utilized in this stage are discussed in (Kettinger, et al., 1995). The desired performance measures that were formulated in the inaugurate stage are compared with the actual performance to uncover pathologies. Jansen and Poot (1995) proposed and demonstrated a technique for the calculation of cycle times based on the transaction concept as used in the DEMO approach. Other techniques like Backward Chaining, Fishbone Analysis and Pareto Diagramming that originate from quality thinking, may also be helpful in the identification of pathologies (Harrington, Harrington, 1995; Harrington, 1991).

Improvement: The improvement stage involves iterative design through the exploration of alternatives that meet the strategic objectives. It is of extreme importance that no alternatives are rejected beforehand because they seem ‘outrageous’. Only when an alternative process does not meet the desired performance measures it should be rejected as a valuable alternatives. Founded in the DEMO approach Jansen and Poot (1995) propose decision rules for creating alternative processes combined with a technique for the calculation of the cycle time of the alternatives. In addition to this, simulation techniques provide powerful tools for the exploration and selection of alternative business processes (Meel, et al., 1995, Meel, 1993). After the selection of an alternative business process, the environment has to be aligned with the existing processes. This means that a proper ‘fit’ has to be achieved between people, work process, information management, and technology in a newly configured socio-technical system. This implies that the design of new organizational rules and communication networks deserve special attention. Before the actual implementation of the new process(es) in the next stage of the BSILC, a ‘prototyping’ session of the new process may be initiated so that the system behavior can be ‘tried out’ to solicit users’ feedback.

Reconstruct: The basic activity in this stage of the BSILC is the implementation of the newly designed business process(es) and possibly supportive IT. As with any major organizational change, the introduction of a redesigned process need to be
performed thoughtfully and carefully. As with the inaugurate stage, it is important to note that the more dramatic the proposed form of business system improvement, the more careful the project has to be reconstructed. The literature on organizational change processes is exhaustive on organizational barriers and pitfalls, and provides good techniques that can be used in this stage. However, I consider this stage beyond the scope of the current research.

**Evaluate**: In the evaluation stage the performance of the improved business system is monitored. This monitoring has to be performed with qualitative as well as quantitative evaluation techniques. The monitoring and evaluation is guided by the performance measures that were formulated in the inaugurate stage. The monitoring focuses on the performance of the new process (cycle time, cost, quality etc.), productivity indices (e.g., the number of orders processed per hour, number of sales closed per week), and possibly the IT performance (downtime, system usage, etc.). The second element in the evaluate stage is the realization of links to the organization's other process management activities.

As I have argued in the previous chapters, communication forms the backbone of any organization, and therefore, when a business system is changed, the communication processes constituting the business system are affected too. In addition to this, inefficient or ineffective communication processes themselves may be considered as a reason for an improvement process. In the next section the role of the TPM in a business system improvement project is examined.

### 6.3 The TPM and business system improvement

The basic assumption underlying the current research is that the coordination of activities in an organization is achieved by means of communication. In the DEMO approach these communication processes have been conceptualized to establish the core of a business system. When a business system improvement project is initiated, this implies that a close consideration of the communication processes in the organization is insuperable (See also: Cecez-Kecmanovic, 1994).

The current section elaborates in more detail on the communication process optimization and business system improvement. First the usage of the TPM as a diagnostic and improvement tool is explained. Then the usage of the TPM is illustrated with two examples taken from the field study performed at Profiles Company. The section is concluded with the explanation of the importance of considering and analyzing business communication as part of an improvement project and locates the TPM as diagnostic and/or improvement tool in the Business System Improvement Life Cycle.

#### 6.3.1 The TPM as a diagnostic tool

The communication processes constituting a transaction type can be represented as sequences of communication acts and transaction states. These elements form the basis components of the TPM. The representation of these components in the form of transaction process diagrams (as demonstrated in chapters 4 and 5) provides a
graphical representation of the actual structure of transaction processes. These TPD’s form the starting point for a characterization of business communication.

The most obvious characterization of transaction processes is based on the outcome of a transaction process. A process can be either successful or not successful. In this characterization, success is defined as to whether the transaction process results in the creation of a fact. In the TPM a fact is only created in the transaction state with status ACCEPTED (5). Unsuccessfulness of a transaction process is used to denote that the transaction reaches a final state without the creation of a new fact, other than the fact that the transaction process has failed. This means that unsuccessful transaction processes end in the transaction state with status CANCELED (8). The communication steps (transitions) that are necessary for the transaction process to reach either of these transaction states is of no importance to the characterization ‘successful’, ‘not successful’, as long as the states and the transitions at the success-layer are covered.

On the basis of the amount of communication steps that are needed to reach a final state, transaction processes are characterized as having a simple or a complex structure. Simple transaction processes involve a minimum amount of communication steps, while complex transaction processes involve more than the minimum amount of communication steps. For successful transaction processes this implies that the ones with a simple structure proceed in a direct sequence of communication steps, from the initial transaction state 0 to final state 5, through the success-layer of the TPM.

The nature of the complexity in complex transaction processes allows a further and more detailed characterization. At the success-layer of the TPM, it can be observed that a transaction process can become complex because there is vagueness or ambiguity in the proposition formulation. In a TPD this type of complexity is observed when the executor of a transaction requests the initiator to reformulate the proposition of the transaction process. This, so-called, proposition formulation-loop is displayed in figure 6.3. A similar type of complexity is the redo-loop. This loop is initiated by the initiator of the transaction process when he finds that the objective action is not executed satisfactory. The initiator then has the option to request executor to redo the execution of the objective action. Figure 6.3 displays the structure of the redo-loop.

![Diagram](image)

Figure 6.3 The proposition formulation and redo loops as forms of complex transaction processes

Transaction processes also become complex when they proceed into a discussion about the raised validity claims. Contrary to the complexity caused by the proposition formulation-loop and the redo-loop, the complexity caused by
discussions about validity claims is located in the discussion and failure-layer of the TPM. As I have described in the theoretical explanation of the TPM in chapter 3, every communicative oriented transaction process is built on the possibility to start a discussion with regard to the claims to truth, justice, and/or sincerity. In the TPM this possibility is integrated as discussion-loops. In the actagenic phase of the transaction process the executor has the possibility to start a discussion about the validity claims raised in the request for action (CA1), and in the factagenic phase the initiator is able to start a discussion on the validity claims incorporated in the state completion (CA3). The first one is called the actagenic discussion while the other is the factagenic discussion. The structure of both discussions as expressed in the TPM is displayed in figure 6.4.

An extreme form of complexity arises when a transaction process moves into the discourse-layer of the TPM. The starting of a discourse-loop is, however, an integral part of communicative oriented transaction processes. The discourse-loop emerges as a result of the discussion about validity claims, and therefore can be started in both an actagenic and factagenic discussion. When the transaction process proceeds in a factagenic discourse-loop, the transaction process is interrupted until consensus is reached about new organizational rules and the initiator requests to continue the transaction. In the case of a factagenic discourse-loop new organizational rules for the execution of a particular type of objective action needs to be discussed. Consensus about the (new) organizational rules underlying the execution allows the transaction process to proceed.

![Diagram of actagenic and factagenic loops](image)

Figure 6.4 Actagenic and factagenic loops as forms of complex transaction processes

In the actual business system, discourse-loops are easy to recognize. Rules for the recognition of discourses have been provided in chapter 3. In the TPM a discourse-loop is easy to visualize, however, the internal structure of the transaction states 11 and 12 are more difficult to display as illustrated in chapter 5. For diagnostic purposes, the identification of a discourse as an extension of a discussion about validity claims provides enough detail. The structure of the actagenic and factagenic discourse-loops are displayed in figure 6.5.

Within one transaction process the different types of complexities of transaction processes (except successful and unsuccessful transaction processes) may, of course, appear in combination with each other.
Next to the characterizations based on the communication steps in a single transaction process, a group transaction processes of a particular type can show a specific pattern that forms an indication for a special characteristic. The characterizations of this category can be considered as a kind of meta-characterization, in other words, the addition of the characteristics of the individual transaction processes allows an aggregated characterization of this type of processes. A meta-characterization of multiple transaction processes provide the observer with more powerful diagnostic possibilities. Repetition of a specific pattern of communication steps is an important element in the determination of the characteristic of a group of transaction processes.

There exists a strong relation between the notions of effective and efficient business communication, and the characteristics of the transaction processes that have been determined above. It is hypothesized that effective and efficient business communication develops along the lines of a successful simple transaction process at the success-layer of the TPM. Successful transaction processes with a proposition formulation-loop, a redo-loop, a discussion loop, and/or a discourse-loop are considered to be less efficient than a successful transaction process at the success-layer of the TPM. Unsuccessful transaction processes are located on the opposite side of the spectrum, they are neither efficient nor effective, and therefore the effectiveness of transaction types is determined as a function of the successful and not successful transaction processes of that particular type.

6.3.2 The TPM as an improvement tool

Communication in organizations is not a stable process in an organization. The participants engaged in business communication are constantly adapting their communication process patterns to the context and its background conditions. These communication patterns cannot only be described and diagnosed by means of TPD's as explained in the previous paragraph, but like spontaneous changes from one TPD to another TPD, deliberate changes in communication processes can also be part of a business improvement project. This implies that transaction processes
that have been diagnosed as being inefficient or ineffective are transformed to become more efficient and effective transaction processes.

The main reason for the occurrence of inefficient and ineffective transaction processes is due to the fact that the participants, in a transaction process, disagree about, or are unaware of, the rules underlying a particular transaction type. A discussion-loop mostly occurs as a first indicator that the participants in a transaction process do not ground the transaction process on the same set of underlying background conditions. As I have explained in chapter 2, according to Habermas these background conditions may relate to the objective world, the social world, or the subjective world. This means that a discussion may be started when, e.g., someone requests something that does not exist (a purchaser ordering some material with a non-existing order number), or acts in a way that is not in accordance with the social standards of the other party (ordering the other to do him a favor), or one of the parties considers the other not to be, sincere (this category of discussion has not been considered in the research). A proposition formulation-loop may occur when the initiator of the transaction process is ignorant of the necessary information that has to be included in the proposition of a request. E.g., a purchaser that forgets to mentions the order numbers when he orders material. A redo-loop may indicate that the executor is unaware of the standards for the successful execution of an objective action. E.g., in the Profiles Company that the produced window frames also need to be polished.

The possibility to initiate a discourse about organizational rules underlying a particular type of transaction provides the means to optimize transaction processes that are distorted (confirmation of this hypothesis can be found in: Mumbly, 1988; Forester, 1989). Therefore the discourse possibility has to be considered as a problem-solving extension incorporated in the TPM that does not only emerge, but can also be utilized in case of distorted transaction processes. Although a discourse has been categorized as an extreme form of inefficient business communication, a discourse may also help to cure and prevent inefficient and ineffective business communication. Newly created or modified rules, or even the mere articulation and confirmation of an existing rule underlying a transaction type, can cause the transaction processes belonging to the particular type to proceed smoothly. In terms of the TPM this means that after a discourse these transaction processes proceed as simple transaction processes along the success-layer.

The initiation of a discourse is advised on the basis of an observed ineffectiveness or inefficiency of a transaction type. It is, however, very important to observe and evaluate the nature of the distorted communication before initiating a discourse. Distorted transaction processes originating from ambiguous rules concerning the exact information necessary for orders from the depot needs a different approach than problems originating from different personal beliefs in the social world. The first can be dealt with in, for instance, the weekly meeting of the department, while the latter requests a more closed meeting. It is also important to note that a single inefficient of ineffective transaction process is not a reason for a discourse. The initiation of a discourse is advisable after transaction processes are observed repeatedly as being distorted.
The discussion of the organizational rules in a discourse proceeds along the lines as I have explained in chapter 3 and is outlined in the norms pyramid (figure 6.6). This means that discourses that emerge from disagreement about informal implicit rules result in (new) informal explicit rules, and discourses on disagreement about informal explicit rules result in formal explicit organizational rules. The discussion of formal explicit rules results in the creation of a new or the confirmation of an existing formal explicit rule. When a discourse is initiated, as a means to improve business communication, it is important to assure that these steps in the norms pyramid are taken and well communicated throughout the organization. It is, however, important to note that the changing of rules will inevitably result in (new) accompanying rules at a lower level of the norms pyramid.

A discourse to resolve disagreements is subject to strict procedural rules. These procedural rules, are founded in the ‘ideal speech situation’ (Habermas, 1973), and need to assure that the better argument can prevail. A precondition for a discourse is the general symmetry requirement stating that a discourse can only succeed when there is a symmetrical distribution of chances to express attitudes, feelings, and intentions, and that the participants have equal chances to command, to oppose, to permit and so on. Next to the general symmetry requirement the participants need to have the same chance to put forward or call into question, to ground or to refute statements explanations, and so on, so that in the long run no assertion is exempted from critical examination (McCarthy, 1978). In a practical sense this means that the workers in an organization participating in the discourse must have equal chances to select and employ possible alternatives, and it has to be monitored that the process by which discourse takes place aims at achieving an ideal speech situation. Only a consensus that is reached under the conditions of the ideal speech situation can count on an unconditional acceptance of the parties involved.

Figure 6.6 The norms pyramid

Opposing the discourse driven transformation of ineffective or inefficient transaction processes and transaction types, there exists the possibility to impose a changed transaction process structure. This type of transaction process improvement can, however, only be used to increase efficiency. On the basis of an observed inefficient transaction process it may be decided to limit the communication moves in the TPM in such a manner that the inefficiency is eliminated. An archetypal example of this
way of optimizing business communication is the transformation of a communicative oriented transaction process to a strategic oriented transaction process. This transformation eliminates all the possibilities for discussion, and therewith a great deal of possible inefficiency.

This, so-called, forced communication process improving has two limitations which make this type of improvement less preferable for long term improvements. In the first place it has a low level of acceptance, because it is not based on a mutual consensus. Contrary to the discourse driven change, the transaction process structure is changed on the basis of power. In the second place, the forced change is just a palliative because the cause for the occurrence of inefficient transaction processes is not taken away, but neglected. This may result in 'efficient' unsuccessful transaction processes. However, there are situations in which the imposing of a changed transaction process is an appropriate approach. When, for example, a transaction process tends to get caught up in one of the loops described above, strategic action may be applied to bring this situation to an end. Also, the case that both actor roles involved in a transaction process are played by the same person in the organization, a discourse is difficult to imagine, and so an improvement is imposed.

In the next section two examples of the use of the TPM and its diagrams for the purpose of diagnosing and improving business communication are illustrated.

6.3.3 Two examples

The previous section, elaborated, from a theoretical point of view, on the TPM as being a diagnostic and improvement tool for business communication. In the current section these theoretical assumptions are underpinned with two examples drawn from the second field study, the study of the Profiles Company, as presented in chapter 5. The first example is a simple example, and concerns the shipping of the produced profiles to the building site (in the field study in chapter 5 denoted as T24:Shipping). The second example is more complex and focuses on problems that arise around the production of the detail planning for the production of the profiles (T19:Planning_production).

During the DEMO analysis of the Profiles Company the business communication concerning the shipping of the profiles to the building site showed a complex transaction process pattern. I observed an ongoing discussion between the person responsible for the planning of the production and the person responsible for the shipping of the profiles. The discussion concentrated on the moment of the request to ship a particular order of profiles. According to the shipper, the planner of the production requested shipping orders too late, forcing the shipper to load the lorry after working hours. The course of this problematic situation was reported in paragraph 5.3.3 in more detail.

When it was assumed that the communication in the transaction type Shipping showed a complex transaction process pattern, this was analyzed in more detail with the TPM. On the basis of interviews and observed communication, TPD's were drawn. The diagrams of the problematic individual transaction processes
concerning the shipping reveal a predominantly complex structure with actagenic discussion-loops, composed of discussions about the claim to justice. Some of these transaction processes end unsuccessfully after a discussion-loop and result in the contracting of an external shipping company (the start of T12:Shipping_profiles), while others end successfully after proceeding through an actagenic discussion-loop. In some occasions a proposition formulation-loop was used to reformulate a modified proposition of the transaction process. For example, a request to delay the shipping, or to ship the order in the afternoon instead of the early morning. The general structure of both types of TPD's are displayed in figure. The communication acts that were uttered to cause the transaction process to proceed from one transaction state to another are not included, because here it concerns characterizations based on multiple transaction processes.

The observation that a particular transaction type can be characterized as being complex, opens up the possibility for improvement by means of the initiation of a discourse. In the case of the transaction T24, a discourse about the organizational rules underlying the shipping of profiles was started. The purpose of the discourse was to achieve a mutually accepted agreement about these organizational rules. In this particular case the rules were modified, this is, however, not a necessity. The discourse by which the organizational rules were modified was presented in paragraph 5.3.3.

![Diagram of TPD's in the transaction type T24:Shipping](image)

Figure 6.7 Two frequently observed TPD's in the transaction type T24:Shipping

The second example concerns the planning of the production of the profiles on the production floor (T19:Planning_production). The production planning is a detailed planning based on the rough planning that is produced as a result of the transaction T17:Planning_order. The transaction type Planning_order only establishes the time-boundaries for the detail plannings like the production planning. These boundaries are based on the historical information, order description, etc., but most importantly on the domain knowledge of the planner. The detail planning for the production floor (T19) allocates personnel, and material for the production of specific orders. The production planner produces the planning one week in advance.

The information needed for the allocation of personnel and material in a detailed schedule of the production floor is retrieved from two kinds of sources. The first source from which information is retrieved concerns documents like the rough planning. The second source is a weekly scheduled meeting. This meeting is called
Order Progress Meeting (Voortgangsvergadering) that is scheduled between the heads of the departments Purchase, Production, and Assembly. The objective of this meeting is to tune the activities concerning the orders at hand.

Figure 6.8 Communication Diagram with informative conversations of A1.9 Plan-Production

For the actor Plan-Production, this meeting provides information that is essential for the production of a detail planning of the production floor. Information about the delivery dates of enameled profiles as well as information about the delivery dates of supplies is exchanged in this meeting. This is important information because the production of the window frames can only start if the enameled profiles and the necessary supplies are delivered. Thus, in order to prepare a detailed planning of the production floor the production planner needs to be in the possession of delivery dates of both the enameled profiles and necessary supplies (see figure 6.8).

Figure 6.9 TPD of the unsuccessful ending of T19:Planning_production

The analysis of the transaction process and the production of a transaction process diagram of T19 is based more on the observations of the production planner than on the recording of conversations. However, the observation of the transaction processes involving the planning of the production revealed that many planning
transactions ended unsuccessfully. The inception phase and the action phase of the planning transaction were completed successfully in most cases. This was concluded from the fact that after the Order Progress Meeting the production planner produced a preliminary planning on the plan board in his office. In the conclusion phase many of the transaction processes proceeded to an unsuccessful ending. This was concluded from the fact that the preliminary planning was not converted to a definitive planning that was communicated to the production floor. The TPD that can be drawn on the basis of these observations is displayed in figure 6.9.

A closer observation revealed that the unsuccessful ending of the planning transactions was caused by the fact that either the enameled profiles or the supplies were not delivered in time. Therefore, the unsuccessful ending of the planning transaction followed on a Order Progress Meeting. The following conversation extracted from an Order Progress Meeting, and brings the cause of the problems with the detail planning to the front. The participants in the meeting are the head of Purchase department (Pu), the head of the Production department (Pr), and the head of the Assembly department (As). The meeting is chaired by the head of the Production department. Every one in the meeting is in the possession of a list of all the orders in hand. The list contains the following information: order#, name of the customer, location of the building site, the agreed delivery date, definition of the project, current status of the order, and the planning with deadlines.

CA1  Pr:  "The next project on the list is 145; De Vries B.V., Kessel. Production in week 17, assembly in week 19. Agreed delivery date is May 17th."

(Addressing Pu)

"Last week you’ve promised to call Reners about the delivery date of the TT50 profiles. What did they say?"

CA2  Pu:  "I’ve called on Friday to the sales rep of Reners, and complained about delivery of the TT50. Although he promised me that the profiles were under way, I still haven’t received anything. This means that even if they arrive today, we will have to wait till Monday to send them to the enamel company. This also means that the profiles will return on the Wednesday of week 17."

CA3  Pr:  "So, there will not be a lot of time left for the production."

CA4  Pu:  "I know, but it’s not my fault. Reners has promised to deliver the profiles more than two weeks ago, and if they don’t keep their promise, what can I do?"

CA5  Pr:  "I will one more time re-schedule the order of De Vries, because I think I can manage the production in one and a half week time, but I have definitely reached the limit. So, please make sure that Reners delivers this week."

CA6  Pu:  "I will do the best I can!"

The fragment of the meeting starts off with the selection by the chairman of a running transaction process from the project list. The weeks in which the order is planned to be produced and assembled are mentioned as part of the introduction of
a new subject in the meeting. This information concerns planning facts created in the transactions T19:Planning_production, and T20:Planning_assembly. The agreed delivery date is a fact created in the transaction T2:Delivery_order. The opening phrase of the chairman focuses at one particular order; the order with order# 145 for De Vries B.V.. The aim of the opening is to summarize agenda related to the progress of this particular order. In CA2 Pu reports that there has not been a delivery of profiles that week, in spite of a promise that had been made by the supplier's sales representative.

After the discussion of possible problems in CA3 and CA4, the production planner announces by means of CA5 that he will re-schedule the order with order number 145. Here we encounter the moment that the transaction process aiming at planning the order in week 17 fails. At the same time a new planning process is stated in which the order is planned for week 18.

The reason that causes the production planner to re-schedule the order is the fact that the supplier does not keep his promise. In the previous meeting the purchaser reported on the problems with the supplier in a transaction process of type T6. He tells that the purchaser promised deliver, but did not deliver. A TPD that can be drawn to represent this transaction process is depicted below (figure 6.10).

The analysis of the minutes of previous meetings revealed that the delivery problems and the re-scheduling problems are common practice. The delivery problems are not only caused by the particular type of profiles that were mentioned in the example conversation, but have general nature. The analysis also showed that the planning of the assembly department is affected by the problems at the purchase department. These observations combined with to desire of the company management to minimize the lead time, justified an improvement project concerning the coordination of the activities between Purchase and Supplier, and the production of the planning for the production floor. The optimization of the communication concerning the transaction type T19:Planning_production can, however, only be achieved by optimizing T6:Delivering_supplier_order.

![Figure 6.10 TPD of an unsuccessful transaction process in T6:Delivering_supplier_order](image)

To optimize the communication in T6, a discourse to establish new rules concerning the delivery of goods is to be initiated. The focus of this discourse has to
be on the conditions for the commissive act of the delivery of supplies when promised by the supplier. At the moment the purchaser knows the delivery period from the different supplies when he requests a delivery of supplies with one of the usual suppliers. This knowledge is based on the delivery periods as mentioned in the catalogs (which also contains the ordering numbers). The delivery periods as mentioned in the catalogs are considered to be the informal explicit rules underlying the transaction process. Normally, the order is performed by standardized ordering forms. The supplier, implicitly, commits himself to deliver the requested material (see section 5.3.2). In order to optimize the transaction, the rules underlying the transaction type T6 needs to be reconsidered, in such a manner that modified rules will prevent the transaction processes to halt. This means that 'hard' delivery period have to be discussed, as well as a, for both parties satisfactory, escape procedure in case of unexpected circumstances cause the delivery to fail. The discourse will have to transfer the informal explicit delivery periods into a set of formal explicit rules that provide the transaction type T6 with a solid basis.

A second, less solid but more easy to accomplish, solution to the re-scheduling problem is to change the structure of the transaction processes constituting the planning transaction T19. In the current situation the production planner automatically prepares a planning for the production floor. The example conversation shows that he prepares the schedules on the basis of the predictions of the Pu. These predictions are actually the agenda of the supplier (or the things the supplier has promised to do).

A new structure of the transaction process can be imposed in which both the information on which the planning is based, as well as the moment on which the information is retrieved are changed. The information that is used for the planning should be based on facts, instead of on agenda, stored in the banks of the transaction types T6 and T7. The usage of the facts of the actual delivery of the supplies prevents re-scheduling in case of non-delivery. Moving the informative conversations from the transaction status T19 PROMISED to T19 REQUESTED, prevents the production planner from promising to prepare a planning without having the right information. The TPD of the changed planning transaction is displayed in figure 6.11.

![Figure 6.11 TPD of the changed transaction T19: planning](image-url)
6.3.4 The TPM and the BSILC

The usage of the TPM for the optimization of business communication is not an isolated activity, it shows to full advantage when it is part of the Business System Improvement Life Cycle. The BSILC provides a methodological foundation to the proposed business communication improvement. In the current paragraph I elaborate on the possibilities and the advantages of using the TPM as part of the BSILC.

The optimization of business communication with the TPM operates next to business system improvement as specified by the DEMO approach. The DEMO approach focuses its attention on the transaction types with initiating and executing actors, the relationship between the transaction types and their relation in the object world and subject world. The transaction structure in an organization is viewed at three levels of abstraction. On the basis of this distinction the optimization of business processes is divided into business system redefinition, redesign, and reengineering. The optimization of the business communication does not intervene in the transaction structure of an organization. It only focuses on the internal structure of the transaction types that exist at a particular moment in time in the organization. Therefore, business system redefinition is beyond the scope of the optimization with the TPM. Changes to the time relationships of the transaction types, resulting in changes in the Process Model, the Action Model and/or the Facts Model, are inevitably part of the business communication optimization. The optimization of business communication may result in the usage of different information banks, or different transaction process structures, the focus of business system redesign. Business system reengineering, the changing of the information or documental implementation of the core business processes in the organization may be affected by the business communication optimization. The business communication that is used at the informational or documental levels can be inefficient or ineffective like the communication at the essential level of the organization. The usage of information systems as part of the communication is an integral part of the optimization process.

The diagnostic and improvement characteristics of the TPM provides an important technique to the already mentioned techniques in the BSILC. In the envisioning stage, the selection of business processes to be improved can also be selected by considering the processes from a transaction processes point of view. Without considering transaction processes in much detail, the TPM allows a quick detection of simple and complex transaction processes, as well as frequently occurring proposition formulation and re-do loops. These observations may be interpreted as a first indication of inefficiencies and thus opportunities for improvement in an organization. In the inaugurate stage of the BSILC the TPM is of little use because this stage is more oriented to the formulation, definition and scope of the improvement project. However, in the diagnose phase the possibility to diagnose and qualify business communication provides an additional tool for uncovering pathologies in transaction processes in an organization. Careful monitoring of the communication and the transformation of this communication to TPD's provides insights that are not covered by other tools that have been proposed so far. The
search for alternatives for the malfunctioning business communication in the improvement stage of the BSILC can greatly benefit from the possibility to start discourses. A discourse, with equal opportunities for all the concerned parties, allows to discuss and compare alternatives. Because the concerned parties are involved in the search for alternatives, the reconstructing stage almost logically follows the improvement stage. If mutual agreement about an alternative to the detected pathology has been reached, the step to implementation is just a formality. In the evaluation stage the possibility to diagnose business communication provides a powerful tool for the early detection of malfunctioning business transaction processes, in the envisioning stage. The malfunctioning transaction processes may point at already existing problems that have not been addressed in the improvement project, or problems that have emerged as a consequence of the improvement project.

Since the optimization of business communication with the TPM is just only one technique in the BSILC, next to the standard techniques, and the techniques provided by the DEMO approach, it is important to link this to other approaches. For example, the analysis of business communication with the TPM provides the analyst with more or less qualitative data on the efficiency or effectiveness of business communication. When this observation is supported by the quantitative data, like the calculation of the possible and actual cycle time of a transaction process, and the amount of processes that have to be completed, a powerful tool to describe the business system emerges.

6.4 Conclusions

In the current chapter I have described the optimization of business communication as the first possible application area of the TPM. Within the business system improvement life cycle the TPM provides a technique to analyze a business system and to start optimization initiatives from a communication perspective. This communication process analysis oriented business improvement approach provides an additional technique to the area of business system improvement or BPR.

The TPM provides a frame for both the diagnosis and the initiation optimization alternatives to malfunctioning business communication. The diagnosis of malfunctioning communication is performed by drawing TPD's from the actual communication processes as they take place in an organization. The diagrams reveal possible inefficient and ineffective characteristics of the communication. The optimization of business communication is performed by initiating discourses with the purpose to evaluate the appropriateness of the organizational rules underlying transaction types. These discourses may result in the modification or just an affirmation of existing organizational rules. In this chapter I have provided two examples extracted from the field study in the Profiles Company as illustration.

Within the radical and continuous business process improvement discussion, the business communication improvement with the TPM provides a technique that is founded in radical improvement but aims at continuous improvement of a business system. The framework for business system improvement as postulated in the DEMO
approach provides the framework for the application of the TPM. From a DEMO perspective radical improvement initiatives are started, while at the same time existing communication processes constituting the transactions in an organization are considered as objects of continuous improvement. By means of embedding the business communication improvement together with the DEMO business system improvement perspective in the business system improvement life cycle, a two way approach to the optimization of business systems takes shape.

In Hooft (1995) it is described that the business processes in an organization demand effective and efficient business communication. In the current chapter I have underlined this assumption and elaborated on a technique to optimize malfunctioning business communication. In line of the research of Rice (1987) and Rice and Shook (1990), the article investigates the commonly accepted hypothesis that, nowadays, businesses need information technology in general and communication technology in particular to develop the communication processes and the business processes to their full potential. Figure 6.12 depicts this relation.

![Diagram](image)

Figure 6.12 The relationship between IT and the business (in: Hooft, 1995)

Although there are some quantitative indicators that affirm that business communication may benefit from the implementation of communication technology, the research does not elaborate on the design aspects of communication technology. In the next chapter, a design of communication technology based on the TPM is proposed, and therewith a design that is line with the business communication optimization that has been presented in this chapter.
7
Supporting business communication

In the competitive market of today, it is more important than ever to have an optimal coordination of the different activities constituting the business processes of the business. Many organizations introduce computer-mediated communication systems (CMCS) to achieve this optimization of the business processes (Gasparro, 1993). It has even been argued that large organizations can no longer function effectively and efficiently without the use of CMCS (see: Veen, 1993; 1994; Hammer, Mangurian, 1987), and that it will become a critical application in the very near future (Gasparro, 1993). Stroucken (1993) differentiates this optimistic view by arguing that large organizations with geographically dispersed units, dependent on many internal and external contacts, and with difficulty in reaching workers, benefit most from the application of CMCS. In contrast to small businesses which are expected to benefit only marginally from the implementation of CMCS.

In this chapter I will not enter into the discussion about the financial benefits of the usage of CMCS, but focus on the design of CMCS. If a business decides to invest in a CMCS for the purpose of maintaining or regaining flexibility and competitiveness, they need systems that support communication relating to their central business processes. However, very little of these systems are founded in a theory of communication, although their main purpose is to support communication. The underlying framework in the design of most CMCS’s that are in use nowadays has a technical nature. This means that the design is guided by technical possibilities and limitations, instead of the nature of the object of their support. If the purpose of a
system is to support communication, Preech et al. (1994) state that the design needs to founded in the language action perspective.

The current chapter proposes a functional design of a semi structured message communication system founded in the theory of communication and the TPM. Like the theory of communication which extends on the language action perspective, a design of a CMCS based in this theory extends on designs that are solely founded in the language/action perspective. The proposed functional design is not guided by technical possibilities and limitations, but by the purpose of the application. Before presenting the design, the ideas underlying communication process oriented structured message systems are examined in section 7.1. Paragraphs 7.1.1 and 7.1.2 present a discussion of the first generation and second generation of communication process support systems founded in the language/action perspective. The focus is on the COORDINATOR as developed by Winograd and Flores (1986) and its successor UTUCS (Agostini, et al., 1994). Section 7.1 is concluded with some remarks on the limitations of the proposed systems. These remarks arise from the theory of communication as described throughout chapters 2 and 3. Section 7.2 discusses a functional design of a CMCS that builds on the first and second generation of CMCS, but includes insights from the theory of communication and its resulting model of business communication. The chapter is concluded with some remarks and conclusions.

7.1 CMCS in the language/action perspective

The applications that are considered to be a CMCS¹ are categorized in two main groups: messaging systems and conference systems (Hirschheim, 1985). The difference between these two groups is located in the fact that messaging systems allow asynchronous communication, while conference systems mediate communication synchronously (Markus, et al, 1992; Culnan and Markus, 1987). Both groups have specific possibilities, limitations and problems, and are both in use for the mediation of inter- and intra-organizational communication in businesses. The group of messaging systems is broken down into Voice Messaging and Electronic Messaging. The research that is presented in the current chapter considers a CMCS to be an electronic messaging system, and the functional design requirements that are developed in this chapter primarily focus on this particular group. If a CMCS is defined within these limitations, it can be described as a computer based system that mediates electronically decoded communication to one or many receiver(s) without any intervening physical document delivery.

Although the diversity in the appearances of CMCS's seems to be enormous, on the basis of their design two different classes are identified:

1. Free format message systems

¹ In the course of the chapter I will narrow CMCS to 'communication process oriented structured message system'. However, I will continue to use the abbreviation CMCS. The reason for the continuing use of this term is justified by the fact that communication process oriented structured message systems are a subclass of CMCS and the requirements that I will describe may also be implemented in, or applied to, other sub-classes falling under CMCS.
2. Semi structured or fully structured message systems

Free format message systems, on the one hand, are the most commonly known type of CMCS's. The messages in this class of CMCS are composed in some kind of editor, and the electronically decoded messages are send to one or more receivers that are determined by the sender. With the contemporary state of the art, the system does not limit the type of messages that may be send. So, text, as well as graphics and sound may be included and sent. Nowadays, the elements included into the message only depend on the preferences of the user. Semi structured or fully structured message systems, on the other hand, provide templated messages. Malone et al. (1987) define semi structured messages as messages of identifiable types, with each type containing a known set of fields, but with some of the fields containing unstructured text or other information. Consequently, fully structured messages contain only predetermined fields. Semi structured or fully structured message systems form just a small group of CMCS's compared to the free format message systems, but with the growing recognition of global systems like the World Wide Web (WWW), they become accepted and used more and more.

The structuring of messages provides several advantages over free format messages. Malone et al. (1987) summarize the arguments to prefer structured messages over free format messages in organizational coordination. In the first place because structured messages form a reflection of the standardized forms that are in use in most organizations. According to the authors it is a common observation that routine information processing in organizations is often performed with structured forms (the second field study in this research confirmed this observation). In the second place, structured messages provide the users with a template which is often considered to be helpful to structure their thoughts. Regarding the use of structured messages in the design of CMCS, Malone at al. remarked that structured messages enable computers to process automatically a much wider range of information, and that structured messages simplified the design of systems that can be incrementally enhanced and adopted. An important limitation of the use of structured message systems is that a rigid message structure may restrict the expressability of the users. To minimize this limitation, Malone et al., conclude that semi structured message systems are preferred over fully structured message systems.

If structured message systems are examined from a technical perspective, the use of the structured messages is justified for two reasons. The first reason is the selection of the information in the message (Hogg, 1985). On the basis of key words, the user is allowed to define a sort of filter which enables him to define what type of messages he likes to receive and what type of messages he does not want to receive. The best known example of a CMCS based on this principal is the INFORMATION LENS (Malone, et al., 1987; Malone, et al. 1986). In this semi structured message system the user is equipped with possibilities to filter and classify incoming messages on the basis of dimensions used by senders in constructing their messages. These dimensions are pre-defined by means of the fields in the semi structured messages. An excellent overview of other CMCS's that are designed for the selection and filtering of messages can be found in (Motiwalla, Aiken, 1993). The second reason justifying the use of structured messages is the linking of messages. This linking may
relate to e.g., work procedures in businesses, like that implemented in the DOMINO office procedure system (Kreiefelts, et al., 1991), COKES (Kaye, Karam, 1987), a specific tasks in an organization, like the support of software design by means of COED (Kaplan, 1990), or business communication processes (Dietz, 1994a; Medina-Mora, et al., 1992). There are not many CMCS’s that link messages into business communication processes. This is explained by the fact that there are (still) not many software developers that consider organizations as networks of commitments together constituting the business process (De Michielis, Grasso, 1994). CMCS’s that use some linking of messages on the basis of business communication processes are the DOMINO office procedure system (Kreiefelts, et al., 1991), and ASCW (Kreiefelts, Prinz, 1993). However, a full implementation of this philosophy can only be found in the COORDINATOR and its successor UTUCS. In the next paragraphs these two systems are considered in detail.

7.1.1 The Coordinator

In 1980 Flores and Ludlow proposed a theoretical framework founded in the action perspective of language (see chapter 2) which, they argued, could form the basis for designing ‘new hybrids of computer and communication technologies’ (Flores, Ludlow, 1980). The authors recognized the importance of communication and the creation of commitments as the central activities of the workers in an organization, and consequently, they concluded that the central component of an information system in an organization needs to be a tool that supports inter- and intra-organizational communication and its resulting commitments. Recent research among managers has confirmed this hypothesis (Cullen, 1995). Flores and Ludlow named the family of tools aiming at this task Coordinators. In the past 15 years the research community has proposed several prototypes of CMCS’s that comply to some extent with the conceptualization of organizational communication of Flores and Ludlow. The first, and perhaps the most influential, is the COORDINATOR² (Bullen, Bennett, 1991; Cullen, 1995).

The COORDINATOR is developed by Winograd and Flores (Winograd, Flores, 1986) as an extension to the initial impetus to the design of CMCS as proposed in (Flores, Ludlow, 1980). The COORDINATOR has been exploited commercially as a first generation conversational system (Winograd, 1988). The first version of the COORDINATOR was released by Action Technology in 1985. An evaluation of the commercial use of the COORDINATOR (Version I) has been performed in (Bullen, Bennett, 1991). The system that has been examined in this research is version II, introduced in 1989. Next to the messaging system, the COORDINATOR (V.II) includes functionalities like calendar entries, and to-do lists, which let the system flirt with Executive Information Systems (Cullen, 1995). I will not consider these additional functionalities, but only focus on the, so-called, conversation manager of the COORDINATOR.

² The COORDINATOR® is a registered trademark of Action Technologies, Emeryville, U.S.A..
The *conversation for action*, as explained in chapter 3, forms the central concept of the COORDINATOR’s conversation manager. Within the structure of the conversation for action, the system provides facilities for generating, transmitting, storing, retrieving and displaying messages. These messages are records of moves in the conversations. Next to the conversation for action (*request*), the manual of the COORDINATOR describes 5 other types of ‘managed conversations’ that may be started. An *inform* conversation is used to convey information when an acknowledgment is wanted that the message is received. The *question* conversation is selected to ask a simple question or to make a simple request. A *what if* conversation is used to ask more open-ended questions, which speculate about possible action. By means of an *offer*, the user proposes to do something for someone, or to suggest some mutual undertaking. Once the other person accepts the offer, the system proceeds the conversation as being a request (conversation for action). The *agree* conversation is started to make an agreement with someone that you will perform some action or will confirm an agreement to perform some action. The typology of messages types applied in the COORDINATOR are summarized in table 7.1. The categories are based on Searle’s taxonomy of speech acts.

<table>
<thead>
<tr>
<th>Message type</th>
<th>Illocutionary point</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inform</td>
<td>Assertive</td>
<td>Providing information</td>
</tr>
<tr>
<td>Question</td>
<td>Directive</td>
<td>Request for information</td>
</tr>
<tr>
<td>Offer</td>
<td>Commissive</td>
<td>Commitment to perform action</td>
</tr>
<tr>
<td>Request</td>
<td>Directive</td>
<td>Request to perform action</td>
</tr>
<tr>
<td>Agree</td>
<td>Directive/commissive</td>
<td>Affirmation of a self imposed commitment</td>
</tr>
<tr>
<td>What if</td>
<td>Directive</td>
<td>Start of a discussion</td>
</tr>
</tbody>
</table>

Table 7.1 The typology of the message types and speech acts used in the COORDINATOR (in: Cullen, 1995).

A managed conversation is a conversation in which some action or discussion is to be completed, a conversation that the COORDINATOR helps to manage, track and guide towards completion. In managed conversations the COORDINATOR suggests different kinds of replies. The types of replies that are offered by the system are based on the type of conversation, who started it, and what kind of replies that have been given already (Flores, et al., 1988). This feature of the COORDINATOR is considered to be the most important benefit of the system. A managed conversation of the types ‘question’, ‘request’ or ‘what if’ can only be closed by the person who starts the conversation. This restriction has been applied because that person is typically responsible for deciding that the actual request in the ‘question’, ‘request’, or ‘what if’ conversation has been fulfilled. In the case of ‘offer’ or ‘agree’ conversations, the addressee is the one who can close the conversation. This restriction is applied because the addressee is typically responsible for determining
that the person who made the offer or agreement has carried it out successfully. Similarly, since an ‘inform’ is an offer of information, only the person to whom an inform is addressed can close the conversation.

When the design of the COORDINATOR is considered, the implementation of Searle’s Speech Act theory (the action perspective) in practice is observed. Business communication as a “social dance of bringing forth conditions of fulfillment, commitment to fulfill them, and completion” is the central philosophy of the system (Winograd, Flores, 1986). The messages in the systems are linked into business conversations that relate to the same subject and are guided towards a completion. By selecting the reply options that are supplied by the systems design, the user moves through the possibilities of a business conversation. When both the sender and the receiver understand the meaning of the conversational steps as expressed in the systems design, they are able to convey an illocutionary point with the content of their messages.

The design of the COORDINATOR is not undisputed. A theoretical examination of the foundations underlying the design of the COORDINATOR by Dietz and Widdershoven (1991) on the basis of Habermas’ theory of Communicative Action reveals that the COORDINATOR is unable to specify which kind of orientation of the participants is required for the ‘dance of request and promise’. In the line of this thought, they have isolated two fundamental problems in the design. Firstly, the designers of the COORDINATOR lack a complete theoretical apparatus for the distinction between rationally and empirically motivated conversations (strategic and communicative action and the associated validity claims), and therefore they are not able to tell exactly what makes a speech act succeed. Consequently, they are unable to tell what kind of action-coordinating mechanism this CMCS does support. Secondly, from the examples given in the literature it seems to be clear that the COORDINATOR is meant to support rationally motivated conversations, but they are not able to exclude empirical coordination of action on principle grounds.

The practical evaluation of the design of the COORDINATOR by Bullen and Bennett (1991) reveals that, although the COORDINATOR identifies different conversation types, the users only use the ‘request’ conversation. In interviews, the users responded that they ignored the choices to select a particular conversation, and just “hit enter” to compose and to send a message. The ‘request’ conversation happened to be the default conversation. However, in spite of the fact that the different conversations were used inappropriately, the research of Cullen (1995) shows that managers highly praise the resulting message linking. He shows that the linking of messages into conversations helps managers 1) to better remember information and 2) to quicker retrieve information. Both aspects seem to have a strong relation to each other, in the sense that if information is better remembered, it is also better remembered to where the information is left. The research does not elaborate on the relation between the two findings.
7.1.2 UTUCS

The COORDINATOR has attracted a lot of attention in the field of CMCS and the basic philosophy has formed a basis for different other applications. Examples of CMCS’s designed on the basis of the action perspective on language are the DOMINO Office Procedure System (Kreifelts, et al., 1991), the INFORMATION LENS (Malone, et al., 1986; 1987), CB Lite (Kogan, 1993), ASCW (Kreifelts, Prinz, 1993) and UTUCS (Agostini, et al., 1994). In this paragraph, I will examine the UTUCS in more detail, because it is proposed as a improvement and as a direct successor of the COORDINATOR, the second generation COORDINATOR.

UTUCS (User-To-User Communication Support) is developed by Agostini and colleagues at the Cooperation Technologies Laboratory of the university of Milan (Agostini, et al., 1994). The system developed out of experiences with the COORDINATOR as well as CHAOS (De Cindio, et al., 1986). The UTUCS system is designed to support a group of people interconnected through a communication network in handling conversations carried through on different communication media. The system is based on the following design specifications:

- It is a multimedia conversation manager, supporting e-mail, group and two-person face-to-face meetings.
- Its conversations follow the Winograd-Flores’ Conversation for Action model, but also offers all the possibilities of conversing freely to its users. Any conversation type (conversation for action, for possibility) can be weakened to become a free conversation with unlimited number of participants.

The design specifications already point at the similarities as well as the differences between UTUCS and the COORDINATOR. The similarity is expressed in the adoption of the ‘Winograd-Flores’ Conversation for Action model’. Therewith the designers of UTUCS affirm that human beings act and inter-act in related utterances constituting conversations. The utterances within a conversation are related to actions (or to possibilities for action) through their illocutionary point. The first difference that catches the eye is the extension of the communication support from a text oriented conversation manager to a multimedia conversation manager. The UTUCS system extends the electronic mail oriented COORDINATOR with a face-to-face couple colloquies module and a face-to-face group meetings module. Both face-to-face modules relate to, or result in, one or more steps in the conversation for action. Therefore, they do not represent fundamental changes in the central philosophy of the system. A more fundamental change integrated in the UTUCS systems is a freer application of the conversation for action structure. On the basis of user experiences with the COORDINATOR, the designers of UTUCS have decided that the conversation for action communication structure model can become a constraint for human behavior (see also: Suchman, 1993). Therefore the system is designed in such a manner that certain communication steps may be skipped, when desired by the user.

The design of the conversation manager in the UTUCS system differs from the conversation manager in the COORDINATOR in that the different conversations may
be started by the sender are reduced. The central conversations in the system are the ‘commitment to do’ conversation, and the ‘commitment to be’ conversation. The communication process structure of these conversations have been depicted in chapter 3. The ‘commitment to do’ conversations correspond to the COORDINATOR’s ‘request’ conversation, and represent the main structure joining cooperative work. They deal with communication where two persons communicate to negotiate the terms of a commitment to do an action that one must accomplish for the other. The ‘commitment to be’ conversation corresponds to the COORDINATOR’s ‘what if’, and consists of conversations for possibilities. Their effect is to transform the organizational setting, i.e., they modify the role distribution within a group and open new spaces for possibilities for its members. The information that is needed or produced in both conversations is communicated with ‘information handling’ and ‘information providing’ conversations. With these four new conversations, the ‘agree’ and the ‘offer’ conversations in the original COORDINATOR are deleted. Table 7.2 summarizes the messages types that are utilized in the UTUCS system.

<table>
<thead>
<tr>
<th>Message type</th>
<th>Illocutionary point</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commitment to do</td>
<td>Directive</td>
<td>Request to perform action</td>
</tr>
<tr>
<td>Commitment to be</td>
<td>Assertive/Directive</td>
<td>Start of a discussion</td>
</tr>
<tr>
<td>Information handling</td>
<td>Directive</td>
<td>Delegate handling of information</td>
</tr>
<tr>
<td>Information providing</td>
<td>Directive</td>
<td>Request for information</td>
</tr>
</tbody>
</table>

Table 7.2 The typology of the message types and speech acts used in the UTUCS.

Although the conversation manager of the UTUCS system differs to some extent from the conversation manager in the COORDINATOR, the fundamental criticism that have been formulated by Dietz and Widdershoven (1991) is equally valid for UTUCS. The system still does not integrate the action orientation of the participants, and therefore fails to take into account an important feature of action coordinating communication. The surplus value of UTUCS is only located in the use of different media to mediate communication.

### 7.1.3 Evaluating the design of the COORDINATOR and UTUCS

When the speech act based designs of the COORDINATOR and UTUCS and more traditional CMCS’s are compared with the theory of communication as developed in chapter 2, it is observed that the speech act based designs show important improvements. In the first place, the language sign that is supported is considered from action perspective. This means that the content of the message is considered in relation to an illocutionary point. With the adoption of conversations as communication entity, the communication process perspective that is incorporated in the COORDINATOR and UTUCS is that of a cyclic communication process. Therewith the systems distinguish themselves from the more traditional CMCS’s, that
only consider language as the carrier of an information content, and that view the communication process as a linear process.

Since the design of both the COORDINATOR and UTUCS are firmly founded in the Speech Act theory, both tools inherit the shortcomings of this theory concerning coordination of action in the social world. On the basis of Habermas' critique on the premises of the Speech Act theory, it is observed that both systems fail to differentiate between empirical and rational coordination of action. In other words, in neither of the systems it can be made clear whether a request, by which a 'conversation for action' or a 'commitment to do' conversation is started, is based on a claim to power or on critizisable validity claims. From the examples given in Flores et al., (1988) and Agostini et al., (1994), it can be concluded that they are both designed to support conversations in which the participants are oriented rationally (Dietz, Widdershoven, 1991).

The shortcomings in the design of the COORDINATOR and UTUCS for supporting transactional communication are located at two distinct but inter-related levels: the speech act level and the conversation level. At the speech act level, qualifiers indicating strategic or communicative action are omitted. This means, for example, that imperatives cannot be distinguished from polite requests. At the conversational level, there exists no difference between strategic and communicative 'dances', while the examination of Habermas' theory, as implemented in the Transaction Process Model shows that there are significant differences in the communication process models of both action types.

In chapters 2 and 3, it was argued that the introduction of Habermas' theory of Communicative Action implies some radical changes to the understanding of action coordinating nature of communication. This changed mode of understanding has consequences for the design of computer mediated communication systems. Since Habermas' ontology differs from Searle's, stressing the fundamental importance of orientation towards mutual agreement, and the primary role of regulative speech in the coordination of action, a design of CMCS based on Habermas' theory differs from one that is on Searle's theory.

The evaluation of both the COORDINATOR and UTUCS extended with the theory of communication results in the following design requirements for a systems that aims at supporting organizational communication:

1. The business transaction process, and its constituent communication phases (actagenic and factagenic conversation) forms the kernel of the system, and every communication process proceeds through, at least, these transaction phases. Communication acts constituting communication processes are grouped into the structure of the business transaction.

2. The system is able to distinguish between strategic and communicative oriented transaction processes, and their distinct communication process structures.

3. On the basis of the distinction between strategic and communicative oriented transaction processes, the system offers the possibility to negotiate validity
claims during the actogenic and factagenic phase of the communicative oriented transaction processes.

4. The system must integrate the possibility to temporarily postpone a transaction process and to start a discourse on organizational rules underlying the transaction process.

5. The system must support information providing conversations during every transaction state constituting a transaction process.

6. Next to the structuring of communication acts into business transactions, the system supports informal communication in and between organizations.

In the next section the functional specification of a new design for supporting organizational communication is proposed. This design is to be implemented in a CMCS called COMMUNIST. The design underlying COMMUNIST is founded in the theory of communication and the TPM as proposed in chapter 2 and 3, and therewith overcomes the shortcomings that are caused by a design that is solely founded in the Speech Act theory.

7.2 Communication and transaction support

The COORDINATOR and the UTUCS system are both responsible for an important improvement of the support of organizational communication from a language/action perspective. However, as it was shown in the previous section, the underlying assumptions are based on a limited understanding of organizational communication. The current paragraph presents the design of the COMMUNIST (COMMUNICATION Supporting Tool) system based on the improved understanding of organizational communication as was developed throughout this research, and the resulting requirements as formulated in the previous paragraph.

7.2.1 Global architecture of COMMUNIST

COMMUNIST is a communication support system for inter- and intra organizational communication of people who are interconnected through a communication network in handling messages. The elements that are described of the system are the functional structure underlying the user interface and the information base that are necessary to operate the system. The technical IT infra-structure that is necessary to implement COMMUNIST is beyond the scope of the research, and therefore is not considered.

The basic architecture of COMMUNIST is composed of two separate communication supporting modules: the free format mail (FF-mail) module, and transactional communication mail (TC-mail) module. This division is justified in the distinct function of informal communication and communication related to the transactions in organizations. The TC-mail module supports communication that is performed as part of the business transactions in an organization, while the FF mail focuses on the remaining communication. The TC-mail module is the innovative part of COMMUNIST, and therefore the attention only concentrates on this module. The FF-
mail tool does not differ from the standard electronic message systems that are in use at the moment. Since free format message systems form the standard in electronic messaging systems, I will not elaborate on this module (for an overview traditional free format mail systems, see: e.g., Stroucken, 1993; Veen 1993; Wisse, 1991). The global structure of COMMUNIST is displayed in figure 7.1.

![Diagram showing the global architecture of COMMUNIST](image)

Figure 7.1 The global architecture of COMMUNIST

The information base of COMMUNIST contains data structures on the messages that are exchanged, these are laid down in the Current Conversations Records, and on the organizational transactions that constitute the business system, these are laid down in Organizational Communication Records. The Current Conversations Records contain information on the messages that have been sent. This information base changes every time the messaging system is used, while the other information base, the so-called, Organizational Communication Records, contains information on the identified transaction types in the organization and stays relatively stable. The Organizational Communication Records are changed when the transaction types constituting the business system are changed (Business System Redefinition), or when the personnel changes. The information in the Organizational Communication Records is composed of the types of transactions with accompanying data types and fact types, and the initiators and executors of the transaction types with accompanying names of the persons responsible in the organization (see section 4.1). The information in the Organizational Communication Record is elicited from the Transaction table and the Data/Facta table of the organization in which COMMUNIST is implemented. This implies that the software of COMMUNIST is a customized piece of software. To illustrate the information content of the organizational communication record, the fact diagram is displayed in figure 7.2.\(^3\) The categorization of the messages in the Current Conversation Records is supplemented with information from the Organizational

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\(^3\) The syntax and semantics of the fact diagrams that are presented in this paragraph correspond to the fact diagrams used in the previous chapters 4 and 5.
Communication Records. E.g., that messages are sent by persons in a particular actor role, or that the message is part of a particular type of transaction.

Figure 7.2 The fact diagram of the Organizational Communication Record

The Organizational Communication Record provides necessary information for the functioning of the TC mail module. In the first place, the Organizational Communication Record sets the boundaries for the transaction types that may be started by its users. On the basis of the communication diagram of the organization the systems determines which actor is allowed to start a transaction with what other actor. In the information base persons in the organization are assigned to actors. So, when the system is used by a certain person, the possibilities to start a transaction process are pre-set. This idea is best illustrated with an example from the field study concerning the scheduling activities presented in section 4.2. For example, in the analysis of the field study I have shown that there is no transactional communication between the actors Student and Plan-Rough-Schedule. If, for example, the system is used by a student, it will produce an overview of the transaction processes that may be started by students. In this overview the possibility to start a transaction process with the actor Plan-Rough-Schedule will not be found, while the system will indicate that the Student is allowed to start a transaction process with the actor Change-Final-Schedule. Similarly, the actor Produce-Final-Schedule is not allowed to start a transaction process with the actor Produce-Rough-Schedule. So, this option is offered by the system.

The second type of information that is provided by the Organizational Communication Record is the type of fact that are created when the transaction process is completed successfully, and the types of data that are necessary in the performance of the transaction process. On the basis of a DEMO analysis of an organization this information can be carefully listed, and the COMMUNIST system is designed to use this information. The possibility to retrieve Data is presented as options which can be selected by the user, and Facta are stored when the transaction process is completed successfully. This aspect is discussed in more detail in the next section. Both types of information are represented, in figure 7.1, by the dynamic link from the Organizational Communication Records to the transactional communication mail module.
7.2.2 The transactional communication module

The transactional communication module is founded in the theory of communication that was developed throughout the previous chapters, and uses the Transaction Process Model as underlying communication process model. The adoption of this model has consequences for the structure of the messages, and the linking of the messages into transaction processes.

The transactional communication module allows the user to start, to resume, or to end, from a particular actor role, transaction processes with other persons in particular actor roles. In principle, there is no limitation as to whether this is with someone within the organization or with someone in the environment of the organization. However, in practice, information on the transactions, data types, and the mapping between persons and actors of organizations in the environment is often not available, what limits the use of TC-mail for inter-organizational use. The COMMUNIST system has no special limitations on the use of the FF-mail module, and when the TC-mail module cannot be used, the users can fall back on FF-mail. The messages used to start, resume or end transaction processes in the TC-mail module are semi structured messages. For the usage of the unstructured fields, COMMUNIST will provide the usual word-processing facilities to support the writing and editing.

The structuring that is used for the messages in the TC-mail module is mainly founded in the structure of communication acts (CA's) (see: par. 3.3.2). The central element in the message is formed by the proposition, consisting of a predication and its accompanying time-for-completion. The predication is a description of the instantiations of the fact type(s) that is/are created if the transaction ends successfully. The fact types constituting the predication are retrieved from the Organizational Communication Records on the basis of the transaction process that is selected by the initiator of the transaction process. For example, when a student in the first field study changes a tutor group by means of T5:Changing_final_schedule, the DEMO analysis of the organization shows that new instantiations of the fact types FT15 tutor_group_member and FT24 meeting are created as a result of this transaction process. When a transaction process of transaction type T5 is started, both fact types are retrieved from the organizational communication record and the student is requested to propose a new instantiation of the two fact types. As the requested changes only have a limited validity, a time-for-completion is added. On top of the proposition, the user has to add an action coordinating indicator. This means that fields are added in which the user specifies 1) a verb characterizing the intention of the user, and 2) whether this verb, and the proposition of the message have to be interpreted in a communicative or strategic manner. If one of the actors starts a discussion in a communicative oriented transaction process, he also has to specify the validity claim he contests. In the field study example this means that the student has to specify, next to the new instantiations of the fact types, that it concerns a question with action type 'communicative'. So, on the basis of the structure of a communication act, three type of elements have to be defined: the proposition consisting of a predication and a time-for-completion, the illocutionary verb, and the action type, where the action type determines the interpretation of the verb and the proposition, and the verb determines the interpretation of the
proposition. Figure 7.3 summarizes the elements of a communication act and their relationship.

![Diagram of action types and their relationships](image)

Figure 7.3 The elements and their relationships used in the structured messages of the TC-mail module

The information diagram provides an unambiguous manner to present the structure of the pre-defined fields in the semi structured messages in COMMUNIST. Figure 7.4 shows relationship between the different elements constituting the communication act and the resulting state that is reached in the transaction process. The object classes 'communication act' and 'status' refer to the unique identification numbers that have been assigned in the TPM. In addition to these elements, it shows that the communication act is performed by a particular actor (here we encounter the connection with the fact diagram of the organizational communication record).

Another element in the structure of the messages is the possibility to retrieve data types that are needed in the performance of a transaction process. In the field studies I shown that information providing conversations play an important part in the carrying through of transaction processes. For example, the scheduling officer needs information about the study advisor's approvals to change courses. Only when the student is in possession of the study advisor's approval, the scheduling officer is allowed to change a course. The data types that may be consulted during a transaction process are retrieved from the organizational communication record. The TC-mail module integrates the option to consult these data types.

Next to the pre-defined fields, the messages need to contain fields that allow the user to enter free formatted text. For example, messages that explain the requested action, or to indicate the reasons why a particular validity claim is contested when a discussion is started.

The messages are linked into transaction processes on the basis of the proposition expressed in the semi structured message. So, propositions with a similar predication and time-for-completion are considered to belong to the same transaction process. The underlying communication process model in which the messages are linked has two modes: communicative and strategic oriented transaction processes. The communicative oriented or the strategic oriented communication process model in the systems are selected by means of the selection of an action type at the message level by the initiator of the transaction process. Since TC-mail is founded in the TPM, the system supports all communication steps that have been defined in the communicative and strategic oriented TPM. Figure 7.5
shows the information diagram of the communication process structure as expressed in the TPM.

Figure 7.4 The facts diagram of the communication act and the transaction state

Figure 7.5 The facts diagram of the communication structure as presented in the Transaction Process Model
The definition of the different elements and their relationships in the COMMUNIST transactional communication module are extended with a specification of the activities or combination of activities that need to be performed by the user in order to operate the system. Herewith, the behavior of the user in relation to the interface of the system is described. The structure of these activities is described with the task analysis technique, as described in (Bots, 1989, Schrijver, 1993).

Figure 7.6 Legend of the task analysis diagram

The task analysis technique is based on the assumption that every activity can be broken down into tasks and decisions. Tasks are represented by rectangles with the name of the task in the rectangle. Decisions are depicted by circles with the name of the decision next to the circle. The order in which the tasks and the decisions are carried out, is determined by the arrows. The arrows that depart from a decision have a condition associated with it. The arrow that departs from the decision will only be followed if, and only if, the associated condition is met. Task structures are specified at several abstraction levels, and decomposition is used to reveal the underlying level of abstraction. To indicate that a task is a complex task, and thus can be decomposed in sub tasks, a shadow is added to the task rectangle.

When the system is started, the first important activity the user has to perform, is the selection of the module that he intends to use. This activity is displayed in figure 7.7. After a login procedure in which the user has to enter his user name and password, he then decides whether he prefers to use the FF-mail module or the TC-mail module. The usage of the FF-mail module is a complex task, but the decomposition of this task is beyond the scope of the research for reasons explained before. When the TC-mail module of COMMUNIST is started, the user decides whether he wants to continue the communication in an existing transaction process, or that he prefers to start a new transaction process. Both activities are complex and can be decomposed.

If the user decides to start a new transaction process, he first selects the actor role from which he wants to start the transaction process (it is possible that some member of an organization fulfills more than one actor role), and the type of transaction process that is to be started (see: figure 7.7). The system provides the possible actor role(s) on the basis of the user name that has been entered, and the possible transaction types that may be started are determined on the basis of actor role that has been selected by the user. Together the actor role of the initiator and the type of transaction process are used to determine the derived fact type stating the executing actor. The information that is used by the system to perform this action is retrieved from the Organizational Communication Record.
After the selection of the transaction type, the user may decide whether he likes to see the data types that are associated with the selected transaction. Herewith the user retrieves information that may be necessary for the formulation of the communication act. When the user has specified the transaction type, the system retrieves all the fact types that are associated with the selected transaction type from the Organization Communication Record. The user has to select the fact types and decide on the values for the specified variables (see: figure 7.8). Herewith the user specifies the predication of the transaction process. According to the structure of the communication act, the user has to specify the action coordinating indicator. Since the communication act that is specified is the initial communication act of the transaction process, the verb is a request of the illocutionary class ‘directives’. So, only in the case of the initial communication act the user does not have to specify the illocutionary verb and the illocutionary class. The action type is not known, so this has to be specified by the user. When the time-for-completion is entered, the specification of the body of the communication act is finished. The user has the option to complete the message with some free text as a means of clarification, and after checking the message is ready to be sent (figure 7.8).

Figure 7.7 The task: using COMMUNIST
Next to the possibility to open a new transaction process, the user has the option to continue the communication in an existing transaction process. When the user decides to walk this path, he has to request the system to display the running transaction processes. When the system displays the running transaction processes, it will display at least the transaction type, the status of these transaction processes, and the time-for-completion. When the user selects a message, the complex activity answering starts (see: figure 7.11). The decision "continuing usage of TC-Mail module?" corresponds with the same status in figure 7.7.

The task structure of the activity with which messages are answered depends on the action type of the transaction process and the current transaction status of the transaction process. This is clearly illustrated by the two modes of the TPM and behavioral alternatives in each transaction state (see chapter 3). This diversity of behavioral alternative complicates the representation of the answering task by means of task structures, because the reply possibilities depend on the role of the actor in the transaction (initiator/executor), the particular state the transaction process has reached at that moment, and the action type of the transaction process. Table 7.3 shows the allowed behavioral alternatives per transaction state. The allowed behavioral alternatives are divided into the possibility to change the action (this can only be done by the initiator of the transaction), and the reply possibilities. The reply possibilities that are printed in italics are available in both the communicative oriented and strategic oriented transaction process. The transaction states that have been defined as final in the TPM do not allow a reply, and thus they are empty.

Figure 7.8 The task: start new transaction process

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4 The discourse states 11 and 12 are not considered because of the distinct nature of these transaction states.
Figure 7.9 The task: enter communication act

Figure 7.10 The task: open existing transaction process

Figure 7.11 shows the task structure of the complex task “answer message”. This task starts with an inspection of the message, and if the user needs extra information, he can decide to consult associated data types. As a result of the inspection and possible inspection of data types, the user can change the action type of the message when he is the initiator of the transaction process. The action type can be changed from communicative to strategic and vice versa. After changing the action type, the user has to select a reply to the message. This last activity is a complex activity, that is decomposed in figure 7.12. The task structures “select reply possibility” and “answer message” have to be considered in conjunction with table 7.3. This means that the decision “change action type” is only offered when this is ticked in table 3.5. The decision “change proposition” is only offered when the transaction process is in the transaction status is DISCUSSED. A result of the selection of this alternative is that the system will proceed, via a ‘request reformulation’, to the tasks ‘start new transaction process. The reason for this procedure is that the proposition needs to remain the same throughout the transaction process. Another special situation
appears when the transaction process reaches the status ACCEPTED or CANCELED. Since there are no behavioral alternatives starting from this status, the user is guided to the decision “answer another message”. The decision “answer to another message” corresponds with the task: open existing transaction process (figure 7.10).

![Diagram](image1.png)

Figure 7.11 The task: answer message

The fact diagrams and the task structures presented in this paragraph provide the functional specification of COMMUNIST, and allow the technical implementation of this system. The specification is presented independently of any specific software platform, and therefore there are no restrictions for implementation.

![Diagram](image2.png)

Figure 7.12 The task: select reply possibility
<table>
<thead>
<tr>
<th>transaction state</th>
<th>next CA by</th>
<th>change action type</th>
<th>behavioral alternatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 START</td>
<td>initiator</td>
<td>✓</td>
<td>request</td>
</tr>
<tr>
<td>1 REQUESTED</td>
<td>executor</td>
<td></td>
<td>promise</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>decline</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>discuss</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>start discourse</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>request reformulation</td>
</tr>
<tr>
<td>2 PROMISED</td>
<td>executor</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 EXECUTED</td>
<td>executor</td>
<td></td>
<td>state completion</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>decline</td>
</tr>
<tr>
<td>4 STATED</td>
<td>initiator</td>
<td>✓</td>
<td>accept</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>decline</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>discuss</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>start discourse</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>re-do</td>
</tr>
<tr>
<td>5 ACCEPTED</td>
<td>Ø</td>
<td></td>
<td>Ø</td>
</tr>
<tr>
<td>6 DISCUSSED</td>
<td>initiator</td>
<td>✓</td>
<td>decline</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>discuss</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>start discourse</td>
</tr>
<tr>
<td>7 DECLINED</td>
<td>initiator</td>
<td>✓</td>
<td>cancel</td>
</tr>
<tr>
<td>8 CANCELED</td>
<td>Ø</td>
<td></td>
<td>Ø</td>
</tr>
<tr>
<td>9 DISCUSSED</td>
<td>executor</td>
<td></td>
<td>decline</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>discuss</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>start discourse</td>
</tr>
<tr>
<td>10 DECLINED</td>
<td>initiator</td>
<td>✓</td>
<td>cancel</td>
</tr>
</tbody>
</table>

Table 7.3 Behavioral alternatives in transaction states

7.3 Conclusions

In the current chapter I have discussed the second possible application area of the theory of communication and the TPM; the design of computer support for communication in organizations. Nowadays, many organizations expect to increase their efficiency and effectiveness, and thus their flexibility and competitiveness, by introducing computer support for their communication. It is stated that the design of the majority of the systems that are in use nowadays is determined by technical possibilities and limitations, instead of the nature of the object of their support.

The current chapter presented a functional design of a CMCS, named COMMUNIST, that is founded in the theory of communication and the TPM. The design of the system is based on the design of the conversation managers as presented as elements of the COORDINATOR and UTUCS. However, since the designs of both systems are solely based on the Speech Act theory, they have inherited the shortcomings of this theory. This means that the communication process models underlying the design of both systems fail to take into account empirical and rational coordination of action (strategic and communicative coordination of action) and the possibilities to start a discussion about validity claims. Since the COMMUNIST system is founded in the TPM both types of coordination are integrated. This results in differences in the design of the systems at the speech act level as well as at the conversation level.
COMMUNIST is an integrated design of a free format message system (FF-mail) and a semi structured message system (TC-mail), supported by two information bases (the Organizational Communication Records and Current Conversation Records). These elements of COMMUNIST have been defined by means of facts diagrams. The behavior of the system is described by means of task analysis diagrams.

The complex structure of COMMUNIST has advantages as well as disadvantages. The more complex structure of two communication modules and supporting information bases provides the possibility to support organizational communication as elements in business transaction processes. This structure allows the business communication to be guided and grouped in transaction processes. With the TC-mail module the communication is guided to completion (successful or not successful). Therewith communication becomes transparent; the status of a communication process is known and its course can be predicted to some extent. By using the essential model of an organization as the boundaries within which people can communicate, the system becomes an integral part of the organization. The information that is used in the TC mail module is immediately retrieved from the information banks of the organization, and the information that is produced by means of the successful completion of transaction processes can immediately be stored in the information bases of the organization.

These advantages of the COMMUNIST system can be interpreted as disadvantages at the same time. The transparency of the business communication is achieved by means of structured fields in the message composition. Some people may argue that this limits the freedom of expression of the users. The embeddedness of the system in the organization limits the usability of the system for inter-organizational communication. This problem becomes a serious problem when electronic communication becomes an accepted medium for the coordination of activities between organizations. However, I see no reason for not implementing a COMMUNIST-like system between organizations as long as the access of the organizations' classified material is secured.

Computer Mediated Communication Systems like the COORDINATOR, UTUCS and COMMUNIST, are systems that are designed on the basis of the thorough examination of the nature of the tasks they have to support. Although this design approach is intuitively appealing, further comparative research with traditional communication systems is needed to examine its benefits.
The research that is presented in this dissertation reports on the search for a better understanding of the structure of the communication that is used between the workers in organizations to coordinate their actions. The understanding of this business communication structure provides better insights in the functioning of organizations, which is in turn useful in the organizational analysis underlying the design of information systems as well as the understanding, controlling and optimization of organizational activities.

The point of departure of the research is not the traditional perspective that is used in informatics, stating that communication is a linear process of exchanging information, but a perspective advocating that communication is a form of behavior by which people coordinate their actions in a cyclic process. It is argued that the traditional perspective on communication cannot be used to obtain an in-depth understanding of the structure of business communication because it considers communication as a black box. The so-called language action perspective considers an organization as a network of inter-acting people that create, maintain, modify, report and terminate commitments, and aims at understanding the content of the black box.

The conceptualization of communication in the language action perspective is not undisputed and several researchers have proposed extensions. This debate has formed the starting point of a re-consideration of the communication concept and the formulation of a broadened theory of communication incorporating the notions of language, communication process and coordination of action.
The research has been divided into two main parts. The first part focused on the development of a theory of communication that provides a satisfactory explanation for the way people coordinate action by means of language. This theory is narrowed down to business communication and is expressed in a model of business communication. The second part of the research focused on the application of the theoretical part in the practice. First the model of communication was applied to communication that is used between the workers in two field studies. Second, the model served as a means for evaluating communication in organizations, and for the determination of design requirements of computer mediated communication systems (CMCS). This epilogue is used to summarize the way of working in these two main parts and the conclusions that can be drawn from the research. The chapter is concluded by presenting an agenda for future research.

8.1 Theory

The goal of the first part of the research concerned the formulation of a theory explaining the action coordinating nature of human communication. This theory was formulated in three inter-related constituent parts: language, communication process and coordination. Language has been considered as a sign by which people communicate. It was argued that the structure of a language sign can be examined from three different perspectives: the representational, the functional and the action perspective. Each of these perspectives highlights different structural aspects of language signs. A representation analysis of language shows the underlying structure and meaning without considering the function of the sign. The functional analysis extends the representational perspective by incorporating in the analysis the function of the language sign. The action perspective considers language to exhibit a behavioral component which is denoted as the illocution of a language sign. Therefore, in the action perspective language signs are called speech acts.

I have argued that the action coordinating nature of communication needs to be understood as an exchange of language signs in a cyclic communication process. Traditionally, communication is conceived as a linear process of a sender sending a sign composed of a formulated meaning, and a hearer interpreting this sign. For the understanding of the coordination of action, this conceptualization of a communication process is insufficient. It has been explained that communication needs to be interpreted as a two way process. As a response I have proposed the cyclic communication process model. In this model communication is perceived as a constellation of coupled exchanges of language signs that are formulated and interpreted.

Although the exchange of language signs in a cyclic communication process does provide an improved understanding of communication, I have argued that it is insufficient for explaining the coordination of activities between interacting people. The coordination of action has been clarified with Habermas' theory of Communicative Action. Central to this theory is the question how socially acting people coordinate their actions. According to Habermas, the mechanism responsible for the coordination of action is the criticizability of validity claims, and
Epilogue

giving rise to negotiations about the claims made. For the understanding of the coordination of action between people, Habermas identifies two orientations of communication: communication is either strategic or communicative oriented. In strategic action the participants strive after their own private goals, and in communicative action the participants are oriented towards mutual agreement.

Together, the three elements constituting the theory of communication provide an explanation for the way people use communication to coordinate action. This theory provide an understanding of communication that greatly extends the conceptualization of communication that is in used traditionally in informatics. By using the representational and functional perspectives of language it allows a detailed analysis of the structure of the language sign. With the action perspective, the cyclic communication perspective and the conceptualization of coordination provided by Habermas' theory, coordination of activities by interacting people is understood. Therewith the theory of communication shows that the belief that human communication is merely used for the transfer of information is based on a poor understanding of communication.

On the basis of the theory of communication, a model of business communication was developed. The first step in the development of this model was to achieve an understanding of the role of communication in organizations. The understanding was founded in Taylor's (1993) definition of organization as a communication mediated coordination of efforts of people working on a collaborative task that has been broken down into a set of specialized tasks. Based on March and Simon's (1958) typology of organizational communication, 5 categories of organizational communication were distinguished: informal communication, precondition creating communication, information providing communication, action initiating communication and action reporting communication. I argued that action initiating and action reporting communication primarily establish the coordination of efforts, while the remaining categories of communication are supportive. I also stated that informal communication was to be exclude from the research. By introducing two dichotomic views of organization (classical - emergent and mechanistic - organic), it was argued that organizational communication does not always exhibit the same nature. The communication in organic organizational forms is characterized by a predominant communicative nature, while the communication in mechanistic organizational forms is characterized by a predominant strategic nature.

A further understanding of the structure of communication in organizations was achieved by examining conceptualizations and models of business communication put forward by approaches in the area of informatics that consider organizations as networks of communication. The examination of the three approaches that comply with this view, namely: the Conversation for Action approach, the SAMPO approach and the DEMO approach, confirms that action initiating and action reporting communication constitutes the core of a business. The three approaches also illustrate the possibility to conceptualize organizational communication as a series of speech acts grouped in business conversations. The Conversation for Action approach identifies four types of these conversations, the SAMPO approach assembles speech acts in a business discourse and the DEMO approach groups
speech acts into a business transaction pattern. The three approaches also show significant differences in their conceptualizations of business communication. The SAMPO and the DEMO approaches consider both communication and objective action in their models, while the Conversation for Action approach is the only approach that provides a detailed account of the structure of the communication. Although the three approaches provide useful insights contributing to the understanding of communication in organizations, none provides a full understanding of its action coordinating structure. Since the conceptualizations and communication models of both the Conversation for Action approach and the SAMPO approach inherit the shortcomings of the Speech Act theory (i.e., the inability to explain the mechanisms that brings about coordination of action), I argued that the transaction pattern, provided by the DEMO approach, is the best starting point for developing a model of business communication.

On the basis of the examination of organizational communication and the theory of communication, a model of business communication was introduced. The model of business communication, called the Transaction Process Model (TPM), describes the structure of both the communication acts\(^1\), that are involved business communication as well as the structure of communication process establishing business communication. The structure of the communication acts was expressed by a formula, based on the \(F(p)\) formula of speech acts proposed in Searle (1979). Like the formula of speech acts, the formula for communication acts is composed of two main parts: a proposition and an action coordinating indicator. The proposition of a communication act contains a predication, this is a constative description of the agreed objective action (tangible or intangible), and a time-for-completion, stating the moment that the predication becomes invalid. The action coordinating indicator is composed of an illocutionary class, a verb, an action type, and possibly validity claims. The verb in combination with the illocutionary class that the verb belongs to in the realm of the sentence, is based on the Speech Act theory, while the action type, possibly extended with validity claims, is an extension extracted from Habermas’ theory of Communicative Action. The core of the process model of business communication is based on the DEMO transaction pattern, and represented by means of a modified state transition diagram technique. The TPM is composed of transaction states and transitions. The transitions from one transaction state to the next are caused by communication acts. The TPM is divided in two partial models, one representing communicative transaction processes and the other strategic transaction processes. The strategic TPM exhibits two layers (success-layer and failure-layer), and the communicative TPM three (success-layer, discussion and failure-layer, and the discourse-layer).

The Transaction Process Model is a complete theoretical model for explaining the structure of the business communication that is conducted by interacting workers in an organization aiming coordinating their efforts when working on a collaborative task. This corresponds with the central research question as formulated in chapter 1.

\(^1\) The new name ‘communication act’ was chosen to highlight the difference between language signs based on the Speech Act Theory and language sign based on the Theory of Communicative Action.
However, the usability of a theoretical model is established in the practice. Therefore the theoretical examination of communication and its action coordinating nature in business was supplemented by a practical part.

8.2 Practice

In the second part of the research the attention was shifted to the practice of communicating in organizations. The purpose of the second part of the research was to establish a relation between the theoretical model of business communication and the daily practice of communicating for the purpose of the coordination of action in organizations. This relation has been established in three ways. First the TPM was applied to organizational communication as observed in two field studies. Second, the TPM was used to diagnose and optimize organizational communication, and finally, the TPM was applied as a model for the determination of functional design requirements of computer mediated communication systems.

In chapters 4 and 5 I have reported on the application of the Transaction Process Model to model the structure of business communication extracted from two field studies. In order to be able to distinguish business communication from informal communication, the TPM was applied to the communication in the field studies in combination with the DEMO approach for organizational modeling. The DEMO approach provides modeling tools for the recognition and description of an organization as a network of communication. Within the DEMO approach this network is described in terms of actors, transaction types and their mutual relationships, and transaction results. The analysis of an organization as a network of transaction processes by means of the DEMO approach was conceived as the starting point for the application of the TPM.

In the first field study, the scheduling office of the university, the face-to-face communication constituting transaction types was observed and recorded. By means of internalizing the form of life in the field study (achieving native competence), the recorded communication was interpreted, transcribed and transformed in the formula for the representation of communication acts. The obtained formulae were parsed onto the communication process structure of the TPM, resulting in Transaction Process Diagrams.

Two conclusions regarding the relation between the theoretical TPM and actual face-to-face business communication were drawn. In the first place it was observed that the TPM could not interpret the structure of all communication processes. Although the structure of the majority of communication processes could be understood with the TPM, the structure of some transaction processes, called implicit transaction processes, showed an unpredicted course. They seemed to end without explicitly reaching a final transaction state as postulated in the TPM. It was hypothesized that written communication in the organization (documents) plays a role in this, so-called, implicit completion of a transaction process. The second conclusion concerned the category of communication that I labeled information providing communication, and that are named informative conversations in the DEMO approach. The role of this type of communication could not be understood
within the communication process structure as laid down in the TPM. To integrate this category of communication, the TPM was extended with the possibility to consult information banks from the transaction states.

In the line of the research methodology followed in the first study, a second, large scale, field study in a medium size production company was initiated. In this second study, both face-to-face and written communication was included and analyzed. The analysis of the field study confirmed the hypothesis concerning the importance of written communication in implicit transaction processes. It was found that documents can be used to replace face-to-face communication in both the actgeneric and the factgeneric phases of transaction processes. Only in case of a breakdown, an implicit transaction process becomes explicit and is continued by means of face-to-face communication. The second study also revealed the role of the communication used in the meetings of an organization. The communication in meetings serves two purposes. In the first place it contains and contributes information regarding the direct completion of transaction processes (including information providing communication). In the second place, meetings contain communication establishing discourses with the purpose to restore the background conditions underlying particular transaction types. The background conditions, interpreted as organizational rules, provide transaction processes with conditions for failure or success.

On the basis of the observation and analysis of the communication in two field studies it is concluded that the TPM, with the information providing extension, provides a detailed understanding of the structure of business communication. The structure of the communication acts constituting actual business communication can be unraveled and represented with the formula for communication acts. The relationship between the communication acts constituting business communication can also be understood, and can be represented by means of TPD's. Together they allow a more detailed description and analysis, and therewith a more detailed understanding of an organization as a network of communication, as offered by the methods used so far.

On the basis of the research findings in the second field study, the usability of the TPM as a means to diagnose and optimize business communication was examined. For this purpose efficient and effective business communication was defined as successful transaction processes that only proceed through the success-layer of the TPM. Inefficient business communication exhibits complex transaction processes patterns that deviate from the success-layer, and proceed through the discussion-layer and/or discourse-layer of the model, or passes through proposition formulation-loops or redo-loops. I defined ineffective business communication as transaction processes that end unsuccessfully. Together with the possibility to draw TPD's, these definitions allow a diagnosis of the quality of business communication. I have argued that the initiation of a discourse on the rules underlying inefficient or ineffective transaction processes, or the imposing of changes and limitations to the possible transaction process structure, are ways to bring about optimized forms of business communication.
Another application area of the theory of communication and the TPM was found in the determination of functional design requirements of computer mediated communication systems (CMCS). The design underlying current computerized systems for supporting business communication is determined by, on the one hand technical possibilities and limitations, and on the other hand by an information processing view of communication. In the course of the research the information processing perspective of communication was replaced by a new theory of communication and a model of business communication representing this theory. As last part of the research, the functional design specification of a semi structured message system for mediating communication, called COMMUNIST (COMMUNICATION Supporting Tool), was presented. This design is presented independently from technical possibilities, but completely in line with the theory of communication and the TPM.

The reflection on the usage of the theory of communication and the TPM leads to some general conclusions. In the first place it is concluded that the theory and the model enable a detailed understanding of business communication and its action coordinating nature in the practice. Not only is it possible to highlight the action orientation of the speaker, the illocutionary point and the content in a structure of the communication acts, it has also been proven to be possible to bring to the front the process structure of the communication acts involved in the completion of a transaction process. When an organization is defined as a network of communication aiming at the coordination of activities, this improved understanding of the structure of business communication also provides a better understanding of the functioning of organizations. A second conclusion that is drawn is that the possibility to analyze and understand the structure of business communication with the TPM contributes to commonly used techniques for business system improvement. Included in a business improvement approach that focuses both on radical and continuous improvement, like the Business System Improvement Life Cycle, the analysis of business communication with the TPM offers additional detailed information about inefficiency and ineffectiveness in an organization, and transaction processes that need to be reconsidered. Finally, a better understanding of the business communication processes provides guidelines for a better design of information technology that is, in any possible way, aiming at supporting human communication and coordination.

8.3 Further research

The research reported in this dissertation provides an improved understanding of communication, and its action coordinating nature, in organizations, at the same time it opens up new areas of research. In the previous sections of this epilogue I have outlined the way this improved understanding was achieved and how this improved understanding has been applied in practice. In the current section I will look ahead, to the areas of research that have opened up. Like the research presented in this dissertation, the possible areas of further research are divided into further theoretical research and further practical research.
8.3.1 Further theoretical research

If the complex area of organizational communication, coordination and action is considered as an area of research, it is argued that the theory of communication and the TPM as presented in this research provide an important contribution, at the same time, however, they leave room for further and more in-depth theoretical research.

The formula that is used for the representation of communication acts uses a high level of abstraction. Future research should investigate whether more detailed syntactical or functional analysis of the proposition of communication acts will reveal unknown lexical indicators that can be held responsible for the grouping of communication acts into business transactions. If these lexical indicators exist, the possibility for automated analysis of business communication aiming at the identification of transaction processes may be investigated.

Although there is no theoretical ground for the assumption that the TPM cannot be applied for all communication aiming at coordinating action between people, future research is needed to confirm this hypothesis empirically. The results of the current research are only applicable to the understanding of the structure of business communication, however, research investigating communication in general may extend the use of the TPM to the analysis of the structure of communication in other areas.

In the section preceding the construction of the TPM (section 3.2) three different approaches to modeling organizational communication were examined. The TPM has been founded mainly in the transaction pattern as proposed by the DEMO approach. By means of putting together the transaction pattern and the theory of communication, the transaction pattern was transferred into a model that allows a detailed understanding of organizational communication. In a similar way, future research could focus on the application of the theory of communication to the conceptualizations that were coined by the other approaches. This may provide a more solid understanding of the structure of business communication and its action coordinating nature to these approaches.

8.3.2 Further practical research

Further practical research based on the theory of communication and the TPM may focus on the further exploration of the application areas that have been proposed in the current research, but it may also focus on finding new application areas. Both directions are discussed in this section.

The description of both the optimization and the supporting of business communication with the TPM can be considered as the start of more in-depth research. In the literature on organizations and the optimization of organizational processes, there is very little attention paid to the communication processes. Like I have argued before, the majority of the literature on organization considers communication as a constant in stead of a variable. When an organization changes or is changed, it is unavoidable that the organizational communication patterns change as well. Future research could concentrate on the usage of the TPM as a
technique for documenting and evaluating changing business communication patterns in changing organizational environments. In addition to this way of using the TPM, a quantitative approach to measuring the lead time of transaction processes should be developed. The quantitative data that can be produced with such an approach can greatly deepen the diagnostic and improvement characteristics of the TPM as proposed in this research.

In the area of computer mediated communication support the current research also opens up important areas of research. Now that a functional specification of a CMCS is provided, and it is hypothesized that a design based on this specifications is better suited for supporting communication, the design should be implemented and tested by means of an application. The building and testing of the software should be followed by research that investigates whether the usage of a system like COMMUNIST improves the quality of business communication, in terms of efficiency and effectiveness, as well as user satisfaction.

New application areas that may benefit from the improved understanding of business communication relate to new trends inspired by the improved technical possibilities provided by Internet. With the rise of virtual organizations, electronic market place, and the like, a new way of doing business emerges. The changing nature of these organizations requires a critical re-consideration of the traditional organizational and information system design approaches. When co-location of organizational groups is no longer important, and permanent location of workforce is no longer relevant, the importance of business communication as a means to coordinate activities becomes visible more and more. In these new organizational forms, other, non-verbal, means for communication play no longer a role. The design, the management and support of these new virtual organizational forms can only operate adequately when there exists a thorough understanding of communication and its action coordinating nature.
References


References


Gasparro, D.M., 1993. E-mail Makes the Move: Moving LAN E-mail into the Enterprise. Data Communications, Vol. 22, No. 18, pp. 103-112.


## Appendix A

The complete Data/Facta table of the Profiles Company (Reijswoud, Rijst, 1994b).

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Samenvatting

De structuur van zakelijke communicatie: theorie, model en toepassing

De idee dat communicatie tussen de mensen in een organisatie coördinatie van activiteiten tot stand brengt wordt in toenemende mate erkend binnen de informatica en de organisatietheorie. Dit heeft tot gevolg dat er een verschuiving plaatsvindt waarbij organisaties worden gezien als netwerken van communicerende actoren die onderling afspraken maken en nakomen, in plaats van actoren die enkel onderling informatie uitwisselen. Hoewel communicatie meer aandacht krijgt als middel om het functioneren van organisaties beter te begrijpen, is er weinig aandacht voor de onderliggende communicatiestructuur. Met andere woorden, communicatie in organisaties wordt beschouwd als een ‘black box’, een proces met input en output, zonder aandacht te besteden aan de inhoud van deze black box.

In dit proefschrift wordt een theorie en model gepresenteerd en geëllustreerd waarmee inzicht kan worden verkregen in de structuur van zakelijke communicatieprocessen. Met zakelijke communicatie wordt in dit proefschrift die communicatie bedoeld die zich richt op het coördineren van de kernactiviteiten van een organisatie. Het doel van het onderzoek is een theorie en model van zakelijke communicatie aan te bieden dat een diepgaand begrip van de communicatieprocessen in organisaties geeft, en zodoende een hulpmiddel kan zijn bij een gedetailleerde analyse van processen in een organisaties voorafgaand aan het ontwerp van informatiesystemen, alsmede een hulpmiddel voor het diagnostiseren en het optimaliseren van deze organisatorische processen.

Het onderzoek is bestaat uit twee delen. In het eerste deel wordt een theorie gepresenteerd die een verklaring geeft voor de wijze waarop mensen in een organisatie hun onderlinge activiteiten coördineren door middel van communicatie.

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Vervolgens wordt deze theorie uitgedrukt in een communicatieprocesmodel. Het tweede deel van het onderzoek concentreert zich op de toepassing van de theorie en het model op de praktijk. Allereerst wordt aan de hand van twee veldstudies geïllustreerd hoe de communicatieprocesstructuur van de zakelijke communicatie in een organisatie met het communicatieprocesmodel begrepen en gemodelleerd kan worden. Op basis van de resultaten van deze studies wordt vervolgens geïllustreerd op welke wijze het model toegepast kan worden als hulpmiddel voor het diagnosticeren en optimaliseren van ineffectieve en inefficiënte zakelijke communicatie. Tenslotte wordt een ontwerp van een communicatie ondersteunend systeem beschreven dat is gebaseerd op de in het theoretische gedeelte beschreven theorie van communicatie en het communicatieprocesmodel.

Theorie en model

In het eerste deel van het proefschrift wordt een theorie en een model geformuleerd dat verklaart hoe mensen hun onderlinge acties coördineren door middel van communicatie. Deze theorie van communicatie bestaat uit drie onderling gerelateerde delen: taal, communicatieproces, en coördinatie.


Coördinatie van actie door middel van communicatie kan alleen worden begrepen als de uitwisseling van tekens in de context van een communicatieproces in beschouwing wordt genomen. Traditioneel worden communicatieprocessen geconceptualiseerd als lineaire processen, waarbij een zender een mentale toestand in de vorm van een taalteken naar een ontvanger stuurt en deze het teken interpreteert en tot zijn eigen mentale toestand laat behoren. Deze voorstelling van communicatie niet voldoende om coördinatie van actie te begrijpen. Daarom wordt in het proefschrift een cyclisch communicatieprocesmodel voorgesteld. In dit model wordt een communicatieproces beschouwd als een paarsgewijze uitwisseling van taaltekens.

Tot slot worden in de theorie de noties taal en communicatieproces uitgebreid met de notie van communicative coördinatie van actie. De coördinatie van activiteiten door middel van communicatie wordt verklaard met behulp van Habermas’ theorie van het communicatieve handelen. Centraal in deze theorie staat de vraag hoe sociale actoren hun acties onderling coördineren. Volgens Habermas is het mechanisme dat verantwoordelijk is voor coördinatie van acties tussen mensen de mogelijkheid om de geldigheidsaanspraken die door middel van communicatie worden uitgewisseld ter discussie te stellen.

Door de drie elementen in de theorie van communicatie in onderlinge samenhang te bezien, kan een gedetailleerde analyse verkregen worden van de structuur van de
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communicatie waarmee mensen in staat zijn hun acties onderling coördineren. De structuur van taal wordt daarbij vanuit drie perspectieven beschreven, de uitwisseling van taal wordt geïnterpreteerd als een paargewijze uitwisseling van berichten en coördinatie als het bereiken van overeenstemming over de geldigheidsaanspraken die in een bericht geïncorporeerd zijn. De complexiteit van de theorie van communicatie toont aan dat de conceptualisering van communicatie als de uitwisseling informatie een naïeve voorstelling van communicatie is.

De theorie van communicatie vormt de basis voor een model van zakelijke communicatie, het Transactie Proces Model (TPM). Dit model beschrijft de communicatieprocesstructuur van zakelijke communicatie.

Voordat het TPM geïntroduceerd wordt, wordt in het proefschrift de rol van communicatie in organisaties nader beschouwd. Organisaties worden daarbij gedefinieerd vanuit een communicatieperspectief. Dat wil zeggen dat een organisatie wordt gezien als een door communicatie geleide coördinatie van inspanningen van mensen die werken aan een gezamenlijke taak die is opgesplitst in gespecialiseerde taken. Op basis van de March en Simon’s typologie van organisationele communicatie wordt de communicatie waarmee de activiteiten van de mensen in een organisatie worden gecoördineerd verdeeld in vijf categorieën:

- informele communicatie: communicatie die geen betrekking heeft op de coördinatie van de kernactiviteit in de organisatie,
- voorwaardenscheppende communicatie: communicatie die tot doel heeft een kader te scheppen waarbinnen de kernactiviteiten van de organisatie kunnen worden uitgevoerd,
- informatieleverende communicatie: communicatie die tot doel heeft om informatie te leveren die van essentieel belang is voor het kunnen uitvoeren van de kernactiviteit van de organisatie,
- actie-initiërende communicatie: communicatie waarmee de taken, behorende tot de kernactiviteit van de organisatie, worden gestart,
- actierapporterende communicatie: communicatie waarmee de resultaten van de uitvoering van taken, behorende tot de kernactiviteit van de organisatie, worden gerapporteerd.

In het onderzoek wordt informele communicatie buiten beschouwing gelaten.

Een verder begrip van de structuur van communicatie in organisaties is verkregen door een analyse van drie theorieën die tot doel hebben zakelijke communicatie te modelleren. Op basis van deze analyse wordt besloten dat communicatie in organisaties het best begrepen kan worden vanuit het transactieparadigma van Dietz. Dit transactieparadigma beschrijft zakelijke communicatie als een proces waarbij subjecten elkaars gedrag beïnvloeden door middel van zogenaamde performatieve acties. Een transactie bestaat uit drie delen: een inceptiefase waarin de subjecten overeenstemming bereiken over een in de toekomst uit te voeren actie, een actiefase waarin de door de subjecten overeengekomen actie wordt uitgevoerd, en een conclusiefase waarin de subjecten overeenstemming bereiken over het resultaat van de in de actiefase uitgevoerde actie. Naast de transacties worden in een organisatie informationele conversaties onderscheiden. Deze conversaties
worden gebruikt om de informatie te verkrijgen die nodig is voor de uitvoering van een transactie.

Het theoretisch onderzoek van zakelijke communicatie wordt afgerond met de formulering van het TPM. Op basis van de theorie van communicatie en de karakterisering van communicatie in organisaties beschrijft het TPM zakelijke communicatie als een proces van toestanden en toestandsovergangen. De toestanden geven de status aan waarin een transactie zich op een bepaald moment bevindt. De overgangen van een status naar een volgende worden veroorzaakt door taalhandelingen. Het TPM beschrijft een formule waarin deze taalhandelingen kunnen worden weergegeven. Het model kent twee modi: een modus voor communicatieve transacties en een voor strategische transacties. Het TPM is opgebouwd uit drie lagen: de succeslaag die het minimale verloop van een succesvol transactieproces beschrijft, de discussie- en mislukkingslaag die het transactieproces weergeven wanneer er een discussie over geldigheidsaanspraken wordt gestart en/of de transactie niet succesvol wordt beëindigd. Tot slot de discourslaag, die de structuur van het transactieproces beschrijft wanneer er een discussie ontstaat over de achtergrondcondities waartegen transacties in een organisatie zich voltrekken en dienen te voltrekken.

Het TPM biedt een volledige beschrijving en model van linguïstische coordinatie van de activiteiten in een organisatie. Tezamen met de theorie van communicatie biedt het TPM een raamwerk dat het mogelijk maakt de structuur van communicatie in organisaties te kennen.

Praktijk

Het tweede deel van het proefschrift richt zich op het gebruik van het TPM bij de analyse van zakelijke communicatie in organisaties en de mogelijke toepassingsmogelijkheden voor het diagnostiseren en optimaliseren van zakelijke communicatie. In dit deel wordt tevens een beschrijving gegeven van de implicaties van het gebruik van het TPM als referentiemodel voor het ontwerp van communicatie-ondersteunende computersystemen.

Het praktische gedeelte start met de rapportage van de toepassing van twee veldstudies waar het TPM is toegepast bij het modelleren van zakelijke communicatie. De eerste veldstudie betreft de planning en roosteren van onderwijsactiviteiten op de faculteit Economie van de Rijksuniversiteit Limburg. De tweede studie beschrijft de communicatie in een organisatie die zich richt op het op maat produceren van aluminium raamprofielen voor nieuwbouw- en renovatieprojecten.

De analyse van de zakelijke communicatie is in beide veldstudies uitgevoerd in combinatie met de DEMO-methode (Dynamic Essential Modeling of Organizations). Deze methode voor analyse van bedrijfsprocessen beschrijft het functioneren van organisaties als een netwerk van actoren die met elkaar transacties voeren. In de DEMO-benadering kunnen deze transacties een documenteel, informationeel en essentieel karakter hebben. In de analyse van de zakelijke communicatie in de veldstudies zijn alleen essentiële transacties, dat wil zeggen
transacties waarmee nieuwe informatie wordt gecreëerd, in beschouwing genomen. De communicatie waarmee essentiële transacties tot stand worden gebracht is onderworpen aan een analyse met het TPM en afgebeeld door middel van Transactie Proces Diagrammen (TPD’en). Deze TPD’en geven het verloop van de zakelijke communicatie in een transactieproces weer in de vorm van een proces met toestandsovergangen, waarbij het TPM als uitgangspunt dient.

In de eerste veldstudie zijn op basis van de observatie van mondelinge communicatie en de omzetting hiervan in TPD’en twee soorten transactieprocessen onderscheiden: expliciete en impliciete transactieprocessen. Expliciete transactieprocessen zijn transactieprocessen waarbij de communicatie van de participanten in een transactie om-en-om verloopt: startend met een verzoek en eindigend in een transactiestatus waarin een nieuw feit wordt gecreëerd, of naar een status waarin het transactieproces met instemming van de participanten wordt beëindigd. In het laatste geval is er dus sprake van een niet-succesvol transactieproces waarbij de verzochte actie niet of niet naar tevredenheid is uitgevoerd. Kenmerkend bij expliciete transactieprocessen is dat de toestandsovergangen zoals deze gepostuleerd zijn in het TPM door expliciete uitspraken van de participanten teveweg worden gebracht. Naast deze expliciete transactieprocessen zijn er impliciete transactieprocesses onderscheiden. De TPD’en van impliciete transactieprocessen laten zien dat niet in alle transactieprocessen de overgang van de ene naar de andere transactiestatus door expliciete uitspraken wordt veroorzaakt. In het geval van impliciete transactieprocessen laten de TPD’en incomplete transacties zien; dat wil zeggen transactieprocessen die bijvoorbeeld eindigen met de uitvoering van de overeengekomen actie en waarbij dus de conclusiefase van de transactie ontbreekt.

Een mogelijke verklaring voor deze impliciete transactieprocessen is het gebruik van een impliciet overeenstemmingsprincipe, dat wil zeggen dat de participanten in een transactieproces het uitblijven van een reactie van de andere partij interpreteren als een instemming. Het gebruik van dit principe veronderstelt dat er in de organisatie een regel (impliciet of expliciet en formeel of informeel) bestaat die aan de participanten bekend is.

In de tweede veldstudie heeft de aandacht zich meer specifiek gericht op impliciete transactieprocessen en op transactieprocessen waarin de communicatie zich ontwikkelt via een discours met als doel de evaluatie van de juistheid van de achtergrondcondities (organisatorische regels) waartegen de transactieprocessen worden volvoerd. Om een beter begrip te verkrijgen van deze aspecten van zakelijke communicatie is naast gesproken communicatie, de schriftelijke communicatie in de organisatie in beschouwing genomen. Hiertoe is de inhoud van zowel gestandariseerde formulieren (bestelformulieren, evaluatieformulieren, etc.) als rapportage (niet gestandariseerde verslaglegging zoals bijvoorbeeld notulen van vergaderingen) geanalyseerd. Tevens is bepaald welke rol deze vormen van communicatie spelen in het volvoeren van transactieprocessen.

Doordat de schriftelijke communicatie in de tweede veldstudie in de analyse is betrokken, kunnen additionele verklaringen worden aangewezen voor het impliciete verloop van transactieprocessen. Op basis van het onderzoeks materiaal
kan worden geconcludeerd dat schriftelijke communicatie gebruikt wordt om mondelinge communicatie, zowel in de inceptiefase als in de conclusiefase van transactieprocessen, te vervangen. Zo vervangen bijvoorbeeld gestandariseerde bestelformulieren bij de organisatie uit de tweede veldstudie een groot deel van de mondelinge zakelijke communicatie tussen de inkoper en de toeleveranciers. Deze formulieren kunnen echter worden herschreven in de formule voor het representeren van taalhandelingen waarmee vervolgens TPD'en van complete transactieprocessen kunnen worden weergegeven.

Tot slot van de analyse van de zakelijke communicatie in de twee veldstudies wordt gerapporteerd over de transactieprocessen die zich ontwikkelen via de discourslaag van het TPM. Het onderzoek laat zien dat deze vorm van communiceren een belangrijk onderdeel uitmaakt van vergaderingen en een belangrijke functie heeft bij het formuleren en herformuleren van de regels in de organisatie. Voor de analyse en de representatie van de structuur van het discours wordt het op Toulmin's argumentatietheorie gebaseerde discoursprocesmodel (DPM) en discoursprocesdiagram (DPD) gebruikt.

Op basis van de twee veldstudies wordt in het proefschrift geconcludeerd dat het TPM, met een extensie die naar aanleiding van de analyse in de eerste veldstudie is toegevoegd en waarmee informatieveranderende communicatie wordt weergegeven, een goede manier is om de structuur van zakelijke communicatie in de beide organisaties te representeren en te begrijpen.

In de twee hoofdstukken volgend op de analyse van de zakelijke communicatie in de twee veldstudies, worden twee toepassingsmogelijkheden van het TPM beschreven. De eerste mogelijke toepassing van kennis omtrent de structuur van zakelijke communicatie betreft het diagnostiseren en optimaliseren van de communicatieprocessen in een organisatie. Hiervoor zijn karakteristieken aan specifieke patronen in TPD'en toegekend, waarbij een transactieprocesverloop dat louter transactietoestanden en transactieovergangen op de succeslaag doorloopt als optimum wordt beschouwd. De initiatie van een discours met het doel overeenstemming over de achtergrondcondities van transactieprocessen te verkrijgen, wordt gezien als middel om transactieprocessen terug te brengen tot dit optimum. Aan de hand van de onderzoeksgegeven van de tweede veldstudie wordt deze toepassing van het TPM geïllustreerd. Er wordt beargumenteerd dat deze wijze van analyseren van zakelijke communicatie een rol zou kunnen hebben als extra hulpmiddel in bestaande methoden voor de optimalisering van business processen (Business Process Reengineering/Redesign en Total Quality Management).

De tweede toepassingsmogelijkheid van de in dit onderzoek geformuleerde theorie van communicatie en het TPM betreft het ontwerpen van communicatie-ondersteunende computersystemen (CMCS). Het proefschrift beschrijft een functioneel ontwerp van een communicatie-ondersteunend computersysteem COMMUNIST (COMMUNICATION Supporting Tool) dat de huidige, enkel op informatie-overdracht gebaseerde, generatie systemen uitbreidt met op taalhandelingen georiënteerde ondersteuning van zakelijke communicatie. Het functioneel ontwerp van COMMUNIST beschrijft een CMCS dat binnen een transactiegedachte de
mogelijkheid biedt om taalgeleide coördinatie van activiteiten in organisaties te ondersteunen. Dit functioneel ontwerp vervolgt de gedachtenlijn zoals deze door Winograd en Flores geïmplementeerd in de COORDINATOR.

Conclusies en verder onderzoek

Uit het gepresenteerde onderzoek kan de conclusie worden getrokken dat communicatie in het algemeen en in organisaties in het bijzonder meer inhoudt dan enkel informatie-overdracht. De werkers in een organisatie coördineren door middel van communicatie de deelactiviteiten waarbij zij samen verantwoordelijk voor het centrale bedrijfspancel. Informatie-overdracht is slechts een van de functies van communiceren en een exclusieve aandacht voor deze functie van communicatie impliceert een onderwaardering van de meer omvattende functie die communicatie in een organisatie vervult.

Op basis van de theorie van communicatie en het daarop gebaseerde TPM is het mogelijk gebleken de structuur van de zakelijke communicatie te modelleren. De resulterende TPD’en geven een gedetailleerd beeld van het transactieprocess waarmee de activiteiten in een organisatie worden gecoördineerd. Het is echter van belang te benadrukken dat toepassing op andere organisaties noodzakelijk is om vast te kunnen stellen of de resultaten van dit onderzoek generaliseerbaar zijn. Vooral nog zijn er geen aanwijzingen die doen vermoeden dat de theorie van communicatie en het TPM slechts een beperkt toepassingsgebied kennen.

De mogelijkheid om de in dit proefschrift beschreven theorie en modelleringswijze aan te wenden voor het diagnostiseren en optimaliseren van zakelijke communicatie biedt een aanvullende hulpmiddel om efficiëntie en effectiviteit van bedrijfspancel te verbeteren. Daar deze ideeën slechts toegepast zijn op de onderzoeksgegevens van een van de veldstudies, is het van belang dat verdere toetsing van de validiteit van deze ideeëen wordt geïnitieerd. Echter ook hier geldt dat geen aanwijzingen zijn gevonden die de toepasbaarheid zouden beperken.

Als uitgangspunt voor het ontwerpen van communicatie-ondersteunende computersystemen geeft het TPM een kader om deze systemen te laten evolueren van informatie-overdragende systemen naar coördinatie-ondersteunende systemen. Gezien de wisselende ervaringen met de COORDINATOR dient verder onderzoek zich te richten op het testen van een op het COMMUNIST-ontwerp gebaseerd communicatie-ondersteunend systeem.

Het verrijkte inzicht in de actiecoördinerende structuur van zakelijke communicatie geeft een raamwerk voor het ontwerpen van nieuwe vormen van organisatie, zoals netwerk of virtuele organisaties. Deze vormen van organisatie steunen in toenemende mate op zakelijke communicatie omdat co-locatie van de werkers ontbreekt. Het ontwerpen, managen en ondersteunen van deze nieuwe organisatievormen zal daarom gebaseerd moeten zijn op een grondige kennis van communicatie en haar actiecoördinerende eigenschap.
Curriculum Vitae

Victor E. van Reijswoud was born in Hengelo Overijssel on May 16th, 1963. After graduating from the 'Openbare Schoolgemeenschap De Bataafse Kamp' in Hengelo in 1982, he attended the 'Twentse Academie voor Gezondheidszorg' where he received a diploma as Registered Nurse (RN) in 1986. After working as a nurse in a psychiatric hospital, and serving military service at the Military Hospital in Utrecht, he decided to continue his studies at the University of Limburg in Maastricht in 1988.

At the department of Health Ethics and Philosophy of the faculty of Health Sciences, he specialized in the use of Artificial Intelligence in health care. His Master's project was conducted at the University of Bath (UK) and evaluated the possibilities and limitations of intelligent patient monitoring systems in highly technical environments (Intensive Therapy Units). After graduating in 1991, he became employed at the department of informatics of the faculty of Economics of the same university. As research assistant he started the research project reported in this dissertation. Together with his supervisor he, and his research, moved to the department Information Systems of Delft University of Technology in 1994, where the research was completed.

The offspring of his research has been presented at a number of international conferences in Europe and the United States. In December 1995 he was awarded to present his research at the Ernst and Young Foundation/ICIS Doctoral Consortium, in Renesse, the Netherlands.