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On the Success of Speech Acts and Negotiating Commitments

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Notes on the Success of Speech Acts and Negotiating Commitments

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Abstract

Technologies that support communication and models used in the development of communications need good underlying theories. One theory suggested as a base for design is speech act theory. Both communication support tools and modelling notations informed by speech act theory have been proposed. Speech act theory forms no unified, single theory, but actually houses several variants for dealing with semantics, pragmatics, and social context of communications. They all have one common feature: they assume that language is not merely a means of describing but also a means for doing things. In this paper we present an overview of speech act theories and their uses in information systems research. Our focus is on examining success of speech acts and commitment negotiations. We suggest a new model of commitment making that combines different speech act theories and their criticisms. It can be used in developing more adequate models of information systems and in highlighting requirements for flexible coordination support tools. The creation of shared understanding and agreement as well as the representation of context are emphasised.

1 Introduction

In this paper we shall examine the success of speech acts and how it relates to the concept of commitment. Notions of the success of speech act, and thereby the conditions of creating commitments are crucial in developing theories of speech acts. Consequently, variations of speech act theory and alternative classifications of speech acts have been developed. This paper probes implications of alternative speech act theories as a foundation for information systems and the development of tools for supporting cooperative work. We shall therefore compare speech act theories and discuss their applications in information systems research. The main focus is on how the concept of commitment is applied in various approaches. We shall describe alternative models of making commitment, and develop an extended model for characterising commitment making. We aim to articulate a view of commitment and the process of commitment making in which the context forms an integral part of the speech act. Accordingly, an agreement on the meaning of a speech act depends on the context. The meaning of a speech act is created in contextual interactions, between speakers and hearers.

The paper will proceed as follows. In the next section we make a short overview of the prominent speech act theories. The focus is on how they structure speech acts, the success of speech acts, and idea of commitment negotiation. In the third section we investigate speech act theory based IS research approaches focusing on conversations and commitments. Fourth section presents an extended model of making commitments and contracts. The last section suggests some conclusions and develops ideas for future research.

2 A Survey of Speech Act Theories

Four different speech act theories have been recognised in IS research. The original speech act theory was developed by Austin [2]. His work was extended by Searle [17, 18] and later by Searle and Vanderveken [19]). Alternative speech act theories have been developed by Habermas [9, 10] and Ballmer and Brennenstuhl [3]. These four speech act theories, their similarities and differences are discussed shortly below.

Austin [2] is widely regarded as the inventor of the speech act concept. In his nominal work "How to do things with words" he aimed at developing a sound theory of language. The most important part of Austin's work was to examine performative uses of language. He extended the functions of language beyond merely descriptive functions so popular in analytic philosophy. In Austin's study language does not stand only for things in the world. Instead, people perform something by saying. Context forms a part of the meaning of performatives. Accordingly, in the study of language use, appropriateness of utterances in the context, rather than on the truth values of propositions, plays an important role. One part of Austin's endeavour was to classify speech acts. He classified speech acts into five categories (see [2, 3]): *verdictives*, *exercitives*, *commissives*, *behabitives*, and *expositives*. The classification has been criticised for overlapping categories, too much heterogeneity of categories, ambiguous definitions of classes, and misfit between the classification of verbs and the definition of categories [3, 19].

According to **Searle** [17, 18, 19] a speech act (illocutionary act) forms the minimum meaningful unit of language. It consists of three components: *context* (speaker, hearer, time, place, possible world), *illocutionary force*, and *propositional content*. An illocutionary force consists of *illocutionary point* (purpose: e.g. to assert, or to direct), the *mode of achievement of the illocutionary point* (e.g. humble way to ask), *strength of the illocutionary point* (e.g. to ask vs. to command), *preparatory conditions* (e.g. the speaker commanding has the power to command), *propositional content conditions* (e.g. one cannot ask to draw a triangular ellipse), *sincerity conditions* (e.g. the speaker who promises intends to do what he promises), and the *strength of sincerity conditions* (e.g. to what extent one believes in what one says).

Using the notions he classified illocutionary acts in five categories [18]: *assertives* (originally representatives; the speaker commits to something being the case), *directives* (the speaker attempts to get the hearer to do something), *commissives* (the speaker commits himself to a future course of action), *expressives* (the speaker expresses a psychological state; feelings and attitudes), and *declaratives* (brings some new state into the world).

An important concept in Searle's work is the concept of commitment. When someone performs a speech act he or she commits to what he/she is saying. The commitment is speaker oriented, and it relates to the success of speech acts. The illocutionary point forms a central device in defining the commitment. As Winograd and Flores [21] state it is "the specification of meaning in terms of commitment entered into by speaker and hearer by virtue of taking part in the conversation", and it defines "the possibilities for what a speaker can do with an utterance". Finally, it defines "the possibilities for how words can be related to the world".

The focus of Searlean speech act theory is on the speaker. The success of a speech act depends on the speaker's ability to perform a speech act that should be understandable and successful. The conditions require that the speaker presents a speech act that is valid in the context: the speaker should be sincere, (s)he should have the authority to perform the speech act, and his proposition should be possible in the context.

Habermas' work has been concerned with developing theories of action in which developing a theory of communicative action has played prominent role. Habermas criticises Searle's speech act theory in several points such as the failure to make distinction between strategic action and communicative action, use of inappropriate classification of speech acts, ignorance of the orientations of the, and inappropriate notion of the success of speech acts.

According to Habermas Searle's theory fails to describe reasons for carrying out the requested actions, i.e. the distinction between empirical and rational coordination of action. In strategic action participants are motivated by their own, private goals. They may compete or cooperate, but even when they cooperate they do it only to strive towards their own goals. Thus, coordination is based on empirical contingencies, especially on use of power. In contrast, in communicative action the participants orient towards mutual agreement, and the cooperation is based on rational grounds: the action is based on justifying different validity claims (truth, justice, sincerity) that can be raised about communication. By raising and assessing these claims cooperators can achieve a common definition of the situation. The distinction between strategic action and communicative action is exemplified by the distinction between a claim to power and a validity claim. For example, the success of a command is based on a validity claim (e.g. prevailing social regulations) and the success of an imperative on a claim to power (e.g. fear of sanctions). In this way only speech acts with criticizable validity claims can motivate the hearers on their own to accept the speech act offer.

The validity claims define conditions for the creation of a commitment. Accordingly, the “success of an illocutionary act consists in the speaker’s entering into a specific engagement, so that the hearer can rely on him”, and this engagement requires that the “speaker makes an offer that he is ready to make good insofar as it is accepted by the hearer” [18, 21] The justification of validity claims means that people act according to requests because they believe that the requests can be justified. Different validity claims denote different worlds of reference; the claim to truth refers to the objective world, the claim to justice refers to the social world, and the claim to sincerity to speaker’s subjective world.

Understanding of speech acts in Habermas’ theory requires the acceptance of the validity claims from the part of the hearer. The hearer can give an answer of “yes” or “no” to the speech act offer of the speaker. The answer “yes” is the condition for the successful speech act, and to utter the “yes” requires that the hearer understands the linguistic content of the speech act, and at the same time accepts the validity claims. For example, in a classroom a request “Could you, please, bring me a glass of water” includes an assumption that there is a water tap near by, that the requester is sincere (he wants the water), and he has the right to ask for this service.

Habermas’ main critique thus addresses the mechanisms that make the speech acts work: it is the criticizability of the validity claims which can raise the negotiations about them, and the success of speech act relies on the hearer’s agreement on all validity claims. If the hearer disagrees with any of the validity claims, a negotiation about the validity claims is needed. Thus, the main factor in the success of a speech act is the agreement on validity claims while Searles theory recognises only speaker’s intention and commitment.

Habermas presents another classification for speech acts. The taxonomy contains the classes imperativa, constativa, regulativa, and expressiva. The imperativa are based on the claim to power, constativa to the claim to truth, regulativa to the claim to justice, and the expressiva to the claim to sincerity. Searle’s directives can be classified both into imperativa and regulativa; an example of the imperativa is the verb “will”. Similarly, Searle’s commissives can be put into regulativa and expressiva: the validity of commissives can be based on claims to justice, or claims to sincerity. Claim to justice can guide both directives and commissives and claim to sincerity both commissives and expressives. Another important difference is the classification between imperativa and other types of speech acts. As Dietz et al. [7] point out imperativa are not seen to be “genuine communicative acts”, but instead they belong to the realm of strategic action.

Habermas’ critique apparently concerns earlier versions of the Searlean theory and it seems that the later developments of the theory [19] seem to overcome some parts of the critique. Especially Searle’s and Vanderveken’s discussion of different conditions for speech acts can provide a means for dealing with validity claims. For example, sincerity conditions deal partly with claims to truth and claims to sincerity. However, the Searlean speech act theory puts in the foreground the speaker’s role in presenting a successful speech act and actually hides the negotiation about the validity claims.

Despite its focus on dyadic relationships through the notion of validity claims Habermas’ classification is too narrow in dealing with larger communication contexts. Moreover the classification of directives and commissives into regulativa speech acts is not always reasonable. It seems to be useful to know if we are commanding or promising. Use of power is a part of everyday action, and we do not want to exclude communication based on the use of power (strategic action) from the analysis of communication.

Ballmer and Brennenstuhl [3] criticise the overall clarity of Searle’s classification, the definition of declaratives as a speech act type, the principles used in the classification (e.g. the difference between directives and commissives is based merely on who is “lead to do something”), unclear selection of illocutionary verbs from all verbs, vague definition of the illocutionary point, and vagueness of the line between illocutionary force and propositional content.

Based on the criticism Ballmer and Brennenstuhl propose a new classification of speech acts, which differs essentially from other approaches examined here. The classification contains both simple linguistic functions such as expression, and appeal, and more complex functions such as interaction and discourse. The authors claim that they provide a “theoretically justified” classification which is “simultaneously based explicitly and systematically on linguistic data”. Models for alternative actions (linguistic functions) are formed and verbs are classified according to the phases of the model. For example, a struggle model consists of 6 “phases” which are presented in Figure 1. The figure shows both the phases and the temporal intensity of the action. Thus, in the middle of the model the verb categories designate busy activities.

The meanings of linguistic expressions are bound to the context, and they are “instruments which aid the user to change the context in a more or less purposive and ” ... ”systematic manner”. Accordingly the meanings can be analysed on two levels: meaning (typical effects in a set of contexts) and full blown meaning (in a specific context). Ballmer and Brennenstuhl question the distinction between illocutions and perlocutions. They argue that “there is no strict demarcation line between understanding and (re)acting. They also doubt the validity of other dichotomies such as illocution/propositional content, and intention/convention. By stripping

off the analysis from these distinctions they seek to "do justice" to the different possibilities to bring effects on the hearer, on the speaker, or on the environment. They also emphasise the intertwining of structural and dynamic aspects of language. Dynamic sequences of speech acts "exhibit special structural patterns", and "the structural patterns are a part of the context in which the dynamic processes go on".

Figure 1: Phases of the Struggle Model (adopted and modified from [3])

As a **summary** of the speech act theories we can conclude that crucial differentiating points between speech act theories are: the classification principles, and classifications of speech acts, the meaningful units of communication, the importance to understand the context, the concept of commitment, and the success of speech acts. Austin's theory is the first attempt to classify speech acts. Searle's theory suggests a structure for speech acts, it clarifies the conditions for their success, and creates a speaker-oriented view for understanding a commitment. Habermas' typologies of action and definitions of success conditions give a hearer-oriented view of the success, and commitment. Ballmer & Brennenstuhl put focus on larger units of communication, and in their view speech acts (verbs) must be analysed in relation to the conversations where they occur. Context, as a structural element of speech acts, is raised up in Searle's theory, and contextuality of speech acts is also recognised in the theories of Austin, and Ballmer and Brennenstuhl.

3 Speech Act Theory in IS Research

Several approaches based on speech act theory have been suggested for computer based tools, and information systems development. These include Coordinator [21], Action Workflow [15], SAMPO [1,13, 14], CHAOS and later UTUCS [5, 6], DEMO [8, 16], and SANP [4]. The Coordinator, SAMPO, and CHAOS present approaches based mainly on Searlean theory. DEMO and its later versions contain features of Searlean theory, but they orient towards the theory of Habermas. SANP is a clear representative of the application of the theory of Ballmer and Brennenstuhl.

Lately, some severe criticism against (especially Searlean) speech act theory and especially its application in IS development has been raised [7, 20]. The most challenging critique has been raised by Suchman [20]. She attacks the design ideals suggested by Winograd et al. [21] implemented in COORDINATOR. Especially she denies the possibilities of speech act theory to capture what people really do, and the need and possibilities to make the commitments explicit, especially in the light of understanding things in relation to "their unarticulated background of community and practice". A kind of compromise between language/action view and its "enemies" is suggested by DeMichelis and Grasso [5]. They emphasise the meaning of context in interpreting the speech acts, and claim that speech-acts are "by necessity" incomplete and ambiguous. They also put in light the importance of listening and learning, and the understanding of work processes.

The most well known model of commitment management is the *Conversation for action schema* of Winograd et al. [21]. This schema was also incorporated into the **Coordinator**-tool which can support coordination and commitment making. It provides a model of rational conversation which makes explicit assumptions of how to behave effectively and efficiently in an action oriented conversation. Criticism against the schema and the whole idea of predefined models of conversations has been raised, and several empirical studies of the failures of Coordinator have been published. However, also positive comments have been heard. Lately, extensions and modifications of that schema have been suggested [7, 14].

DEMO (Dynamic Essential Model of Organisations) [8,16] is a method for modelling organisations. Essential transaction forms the core concept of DEMO, and they define the most important patterns of organisational behaviour. DEMO makes a distinction between documental, informational and essential level.

Thus, essential actions are different from pure informational actions (emission, reception, reproduction, derivation), and documental actions (e.g. store, transport, destruct). The concept of essential transaction is depicted in Figure 2.

Actagenic (action generating) conversations result in the generation of agendum (something that should be done), and factagenic (fact generating) conversations aim at accomplishing facts (states of affairs).

Figure 2: Essential Transaction (from [8,16])

In DEMO the individual speech acts are presented through concepts speaker, action-coordination indicator and proposition. Action-coordination indicators consist of a performative verb, a communication type, and a validity claim. Communication types refer to the Habermas' typology of communication types: strategic or communicative type. Further, the proposition is characterised by the description of the future action and period for completion. Their speech act description is depicted in figure 3.

Figure 3: Speech act Definition in DEMO (from [16])

Milan Conversation model [5] supports a submodel of commitment negotiation. Steps of the model include: a request/offer, a modified request/offer, a counter request/offer, agreed on request/offer, delivered, accepted/refused, and cancelled. The model resembles the CHAOS model [6] and even Coordinator. However, the commitment negotiation is made more explicit.

Chang and Woo [4] present a speech-act based negotiation protocol (**SANP**). It is informed by the speech act classification of Ballmer & Brennenstuhl [3]. The protocol follows the Struggle and Institutional Models. In their prototype a conversation type called "SANP" has been defined as well as conversational moves such as "Claim". Possible answers for the speech acts are also presented in the speech act definitions (for example, "agree" and "dissent" form reasonable responses to a "claim").

SAMPO [1, 13, 14] does not instigate any predefined model for communication. Rather, it is an approach for modelling communication enabled through information systems. It provides concepts and notations for modelling communications. Its basis is Searlean speech act theory and discourse analysis. Hence, its view of commitments and conversations is broad. SAMPO covers not only conversations, speech acts and their perlocutionary effects, but also physical acts. It recognises the need to understand commitment negotiations and contracts between people.

4 Commitments and Speech Act Success

Alternative speech act theories are not exclusive. Although they have been "attacks" against each other, their promising ideas can be integrated. This kind of work has earlier to some extent been carried out by e.g. Lyytinen and Hirschheim [12], Dietz [8], and Reijswoud et al. [16]. For example, Dietz [8] talks about acceptive acts which are needed after statutive acts to bring an "establishment" of a new fact. The phases of actagenic and factagenic conversations model how a common understanding can be created

4.1 Speech Act Understanding, Acceptance, Mutual Commitment

In this section we shall develop an extended framework of commitment making where the success of speech acts can be evaluated. In this framework we define the success and effects of speech acts in a way that recognises both the speaker and hearer. The framework is depicted in Figure 4.

Figure 4: Speaking, Hearing, and Making Commitments

In this model a speaker performs a speech act that is understandable, i.e. it can be understood by the hearer. This requires, that (s)he succeeds to present both the illocutionary force and the propositional content in a way that can be understood in the context where the speech act is performed. If the speaker succeeds, the hearer can understand the speech act. This, however, does not guarantee that (s)he accepts the (validity claims of the) speech act. In this stage we use Habermas' idea of validity claims. The creation of a mutual commitment requires both a mutual understanding of the illocutionary meaning, and a mutual agreement on validity claims.

We agree with Ballmer and Brennenstuhl [3], that it is difficult to clearly distinguish between an illocutionary act and a perlocutionary act. Therefore, the acceptance of a speech act eventually requires that some perlocutionary acts are performed. For example, acceptance of an assertive requires that the hearer believes that the speaker presents a fact, and behaves accordingly by confirming or changing his beliefs. Also the (perlocutionary) effect of a speech act is crucial. If the speech act requires some actions to be performed after the acceptance, then these actions should be performed due to changes in beliefs thereafter. The actions triggered by the commitments can be simple or complex. For example, an assertive can trigger the storing of the assertive as a "fact" for later use. Sometimes a sequence of actions follows. For example, a nomination can cause a long sequence of speech and instrumental acts. Sometimes no action is needed, and the commitment can be the only result (for example, the hearer comes to know a new "fact").

We make a distinction between the concepts of speaker's commitment, hearer's commitment, and mutual commitment. A speaker's commitment is related to the speaker's ability to represent a valid and understandable speech act (offer). Hearer's commitment is created if s(he) understands the speech act, and accepts it. Both *speaker's commitment*, and *hearer's commitment* are needed in order to produce a successful speech act. A *mutual commitment* is a product of a successful (sequence of) speech act(s). Mutual commitments that create commitments to action are called *contracts*. For example, when a manager requests a report from her secretary, and the secretary promises to deliver it, we have a contract. The existence of the contract requires that both participants recognise it.

In the following we outline a schema that combines the speech act definitions of Searle, and Habermas. Most parts of the structure are derived from Searle's theory, but also the validity claims are added to the speech act definition.

speech act : <context, illocutionary_force, validity_claim, propositional content>

context: <speaker, hearer, time, place, possible world>

illocutionary_force: <illocutionary point, mode of achievement of the illocutionary point, propositional content conditions, preparatory conditions, sincerity conditions, degree of strength of illocutionary point, degree of strength of sincerity conditions>

illocutionary point: <assertive | directive | commissive | declarative | expressive>

validity_claim: <claim to power | claim to truth | claim to justice | claim to sincerity>

propositional content: <issue>

speech act effects: <speech act> → <instrumental act | speech act | instrumental act & speech act || >

4.2 Dynamics of Speaking and Hearing

The suggested model provides feedback from the different phases of the communication. In the first step, negotiation mechanisms concern with the “understanding” which means that the ambiguities of the message can be discussed (e.g., to create a shared context, to clarify terms used, and to clarify the illocution). In the second step the validity claims can be evaluated. Thus, the creation of a mutual commitment often requires more than one single speech act, and it is produced in a negotiation. The results of this negotiation are shared understanding and agreement if they can be achieved. We do not assume that the communicators are fully rational. For example, sometimes the hearer might accept the claims without a deeper analysis of them: s(he) can accept the power claims, accept lies as facts, accept facts as lies and so on.

The context includes both the material, and the linguistic world produced through the history of work activities. The context forms a dynamic object. It will change all the time during the conversation through changes in beliefs, commitments, offers, and claims. For example, an answer to a question changes the context, because after the answer the conversation context includes the answer. The speech acts, commitments, contracts and conversations have effects on the context and vice versa.

The relationship between speaking and acting is not straightforward. As pointed out in many speech act classics, “we can not fry eggs with words” and things can be done without words. Responses to speech acts are given without words and knowledge is embedded in action. Commitments do not always lead to a proper action, and they may have to be negotiated again, deadlines are not kept and so on. Because of that modelling of information systems can not be based solely on speech acts, commitments, and conversations, and we have to understand the states of the world (for example, material flows) and their relations to the world of speech acts.

4.3 Conditions of Success

In the definition of the success of the speech act we have to consider both the speaker’s and hearer’s view. In our view the success of speech act requires the mutual understanding and agreement on context, illocutionary force, propositional content, and context (table 1).

Communicator	Illocutionary force	Propositional content	Validity claim	Context
Speaker	Speaker succeeds in presenting a proper illocutionary force in the context	Speaker presents an understandable and valid proposition in the context	Speaker performs a speech act that conforms to the validity claims in the context	Speaker and hearer share the understanding of the context
Hearer	Hearer understands the illocutionary force in the context	Hearer understands and accepts the proposition in the context	Hearer accepts the validity claims in the context	

Table 1: The Conditions of Speech Act Success

The success of speech act requires, that the speaker and the hearer have a shared understanding of the context, speaker succeeds in performing an understandable and valid speech act, and the hearer understands the content and illocution of the preceding speech act and accepts its validity claims. All the constituents - illocutionary force, propositional content, and the validity claims are interrelated to the context so that the

context constraints the success (validity) of the other constituents. In addition, the success is also related to relationships between the constituents (figure 5).

The figure states that there are a number of conditions for success. The context constraints what can be said in a discourse, while people try to make understandable, valid and relevant moves. Accordingly, if they try to perform successful speech acts they use relevant and coherent illocutions (e.g. answer to questions), present propositions that are understandable and relevant in the stage of discourse, they use propositions that are in concordance with the illocutions, and do not try to act against the norms (e.g. they are sincere, they use only the power they actually have).

Figure 5: Relationships Between Success Conditions

4.4 Classification of Speech Acts According to Success

The speech acts in SAMPO [13, 14] were classified as follows: 1) self-defeating speech acts, 2) inconsistent speech acts, 3) successful but defective speech acts, and 4) successful and nondefective speech acts. Self-defeating speech acts cannot achieve their intentions in any context of utterance because of self-contradictory conditions of success. An example of a self-defeating speech act could be "I promise that I will not keep the promise". Inconsistent speech acts are inconsistent with their contexts of utterance. For example, a speech act where "the speaker asks the hearer to draw a square with five edges", or a speech act where "a speaker promises to do something in the past" are doomed to be unsuccessful. Successful but defective speech acts might obtain their intentions in their context although some conditions are not obtained. For example, one can promise to prepare a report (e.g. a dissertation) at some defined time (e.g. Midsummer 1989) although he does not believe he can manage to do it. Successful and nondefective speech acts include all correct uses in their contexts when all the necessary conditions are satisfied.

The new definition of the success of speech acts makes the analysis more complex. Especially the evaluation of the validity claims requires the extension of the classification. In addition, it is not easy to define "validity rules" for people. For example, a non-bureaucratic hearer might accept a request to make a report although the organisational rules do not require him to do that.

The idea of the extended classification of speech acts according to success is presented in table 2. The success of speech acts is analysed from both the speaker's and the hearers side. In the classification the understandability and validity of all the constituents is used. Actually this produces 2^8 (=256) classes, but here we present only some example classes. We have excluded from the table all classes where both parties can not represent/understand the context, because in these cases it is quite clear, that the speech act cannot succeed. In the classification we, however accept also irrational, insincere speakers and hearers.

The table shows that it is very difficult to define the success of speech acts, especially when we leave the complete rationality assumptions. For example, in real life, a hearer can accept a request without knowing whether the speaker has the right to make the request. The hearer can even do something without knowing what was the speech act offer. The example marked by asterisks (*) denotes to a situation where the speech act is understandable and valid in all other respects except that the speaker utters a speech act with invalid validity claims (for example, he is not sure of his authority). However, the hearer accepts it as a valid speech act. Theoretically, the speech act is unsuccessful but in practice it can produce at least a partial commitment.

In actual life, we cannot guarantee the rationality. People make mistakes, the full context is impossible to know, and the validity of propositions is difficult to achieve and redeem, the validity claims are not always

clearly stated (e.g. the norms). We have to live with faulty receipts, unclear definitions of positions, and uncertainty of the availability of some articles ordered. In information systems analysis and specification, it is, however, important to evaluate the possibilities of success of speech acts and also to define means to handle the ambiguous and unsuccessful ones.

Speaker				Hearer				Success
C	IF	Prop	VC	C	IF	Prop	VC	
U	U	U,V	V	U	U	U,V	V	Successful
U	U	U,V		U	U	U,V		Unsuccessful
NV				NV				
U	NU	U,V	NV	U	U	NU,NV	NV	Unsuccessful
U	NU	NU,NV	V	U	U	NU,NV	V	?
U	NU	NU,NV	V	U	N	U,V		Unsuccessful
				NV				
U	NU	NU,NV	V	U	N	U,V	V	?
U	NU	NU,NV	V	U	N	NU,NV	V	?
U	U	U,V		U	U	U,V	V	? (*)
NV								
U	U	U,V		U	U	U,V		Unsuccessful
NV				NV				
U	NU	U,V	NV	U	U	U,V	V	?
U	NU	U,V	NV	U	NU	U,V	NV	Unsuccessful
U	NU	NU,NV	V	U	U	U,V	V	?

Table 2: The Success of Speech Acts

(Legend: C: Context, IF: Illocutionary Force, Prop: Propositional Content, VC: Validity Claim, U: Understandable, NU: Not Understandable, V: Valid, NV: Not Valid)

5 Conclusions

Different speech act theories are usually seen as attacks on each other. Our approach suggests, however, the integration of the best features of them. Accordingly, we have combined views from different theories to clarify the concepts of commitment, the success of speech acts and the process of negotiating and creating commitments.

The success of speech acts is determined both by the speaker and the hearer, and it depends on the creation of a shared understanding, and an agreement. Creation of simple commitments requires mutual understanding and the acceptance of a speech act. In our view there are different “levels” of commitments such as the commitment of the speaker, commitment of the hearer, mutual commitment, and a contract. The first two are related to single commitments whereas contracts are created in more complex sequences of speech acts. Contracts are related to action: in contracts both speakers and hearers commit themselves to some future action

The contributions concern mainly theory. The paper clarifies the conditions of success of speech acts, and hence, it also clarifies the concept of commitment, and commitment negotiation. The results can be applied both in the development of communication modelling and in the development of tools for supporting communications and coordination. The ideas presented here help to develop more accurate models of communication. They also force the developers to think more thoroughly, how commitments and contracts are

created. The levels of commitments proposed suggest some guidelines to the development of commitment management and coordination applications. In development more emphasis is needed in the modelling and support of creating shared understandings, especially in the representation and recall of the context. For example, multimedia could help in the presentation of materials needed in negotiations. In the coordination tools flexibility is needed, and they should help the users to present many-sided views of their ideas, and discuss them to create shared understandings. The tools, for example, could help them to better keep track on what really has been requested and promised, and what is the state of the understanding and agreement. Agreement cannot be coerced by computer support, but computers can give spaces for representation where people can compare their views and negotiate, help them to recall commitments and contracts, track the states of commitments, and also remind people of their roles in some routine workflows.

REFERENCES

1. Aoramäki E., Lehtinen E. and Lyytinen K., A Speech-Act Based Office Modelling Approach, *ACM TOOIS*, Vol. 6, No. 2, April 1988
2. Austin J., *How to do Things with Words*, Claredon Press, London, 1962
3. Ballmer Th., and Brennenstuhl W., *Speech Act Classification, A Study in the Lexical Analysis of English Speech Activity Verbs*, Springer Verlag, Berlin Heidelberg, 1981
4. Chang M. K., and Woo C., A Speech-Act-Based Negotiation Protocol: Design, Implementation, and Test Use, *ACM Transactions on Information Systems*, Vol. 12, No. 4, Oct. 1994
5. DeMichelis G., and Grasso M., Situating Conversations Within the Language/Action Perspective: The Milan Conversation Model, *Proc. of CSCW'94 conference*, ACM, Chapel Hill, USA, 1994
6. deCindio F., Simone C., Vassallo R., Zanaboni A., CHAOS: A Knowledge-Based System for Conversing Inside Offices, in *Proc. of IFIP WG8.4 Workshop on "Office Knowledge Presentation, Management and Utilization"*, 17-19 August, 1988
7. Dietz J., and Widdershoven G., Speech acts or communicative action, in *Proc. of the second European Conference on Computer-Supported Cooperative Work* (eds. Bannon L., Robinson M., and Schmidt K.), Sept. 25-27, 1991, Amsterdam, The Netherlands
8. Dietz J. L., Modelling Business Processes for the Purpose of Redesign, in *Proceedings of the IFIP TC8 Open Conference on Business Process Re-engineering: Information System Opportunities and Challenges*, Gold Coast Queensland, Australia, May 8-11, 1994
9. Habermas J., *The theory of communicative action*, Volume 1, Beacon Press, Boston, 1984
10. Habermas J., *The Theory of Communicative Action*, Vol. 2, 1987
11. Lehtinen E., and Lyytinen K., Action Based Model of Information System, *Information Systems*, Vol. 11, No. 4, 1986
12. Lyytinen K., , Hirschheim R., Information Systems as Rational Discourse: An Application of Habermas's Theory of Communicative Action, *Scand. J. Mgmt.*, Vol. 4, No. 1/2, 1988
13. Lyytinen K., and Lehtinen E., Discourse Analysis as an Information System Specification Method, in *Report of the 7th Scandinavian Research Seminar on Systemeering* (ed. M. Sääksjärvi), Helsinki Business School, Helsinki, 1984a
14. Lyytinen K., and Lehtinen E., On Information Modelling through Illocutionary Logic, in *Report of the Third Scandinavian Seminar on Information Modeling and Data Base Management* (ed. Kangassalo H.), Acta Universitatis Tampereensis, Ser. B 22, University of Tampere, Finland, 1984b
15. Medina-Mora R., Winograd T., Flores R., and Flores F., The Action Workflow Approach to Workflow Management Technology, *Proc. of CSCW'92 Conference* (ed. Turner J., and KRAUT R.), ACM Press, 1992

16. Reijswoud V. E., and van der Rijst N. B., Modelling Business Communication as a Foundation for Business Process Redesign: A Case of production logistics, *Proc. of the 28th Annual Hawaii International Conference on System Sciences*, IEEE Computer Society Press, Los Alamitos CA, 1995
17. Searle J., *Speech Acts - an Essay in the Philosophy of Language*, Cambridge University Press, London, 1969
18. Searle J., *Expression and Meaning*, Cambridge University Press, Cambridge, 1979
19. Searle J., and Vanderveken D., *Foundations of Illocutionary Logic*, Cambridge University Press, London, 1985
20. Suchman L., Do Categories have Politics? The Language/Action Perspective Reconsidered, *Proc. of 3rd ECSCW Conference* (eds. DeMichelis G., Simone C., and Schmidt K.), 1993
21. Winograd T., and Flores F., *Understanding Computers and Cognition*, A new foundation for design, Ablex Publishing Company, 1986