Towards a Language for Business Action Theory

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Abstract
Business Action Theory is an established framework for modeling business processes from an action perspective. We develop the outline of a language that is consistent with this theory and show how it can be applied to analyse the commitments that are made in the course of a business process.

1 Introduction

The literature on communicative action provides a broad spectrum of frameworks to describe business processes, e.g. Business Action Theory (BAT; Goldkuhl, 1996; Goldkuhl, 1998; Goldkuhl and Lind, 2004), Dynamic Essential Modelling of Organizations (DEMO; Dietz and Habing, 2004; Liu et al., 2003; Dietz, 1999; Reijswoud and Dietz 1999; Reijswoud, 1996), Action Workflow (Kethers and Schoop, 2000; Medina-Mora et al., 1992; Denning and Medina-Mora, 1995), Action-Based Modeling (Lehtinen and Lyytinen, 1986) and Conversation for Action (Winograd and Flores, 1986). Among these frameworks BAT can, in a certain sense, be seen as the most general because it does not commit the modeler to any specific methodology. On the one hand this is an advantage: The modeler can choose freely the methodology that is most appropriate in the actual application context. A possible choice would be that of the Situation-adaptable work and Information systems Modelling Method (SIMM; Goldkuhl, 1996) as was suggested in the same paper that introduced BAT (ibid.).

But on the other hand the lack of a dedicated modeling methodology also represents a disadvantage because the choice of a particular methodology that was not tailored for BAT also implies that the modeler is not supported in applying BAT. As a theory represents stable and fundamental knowledge it makes sense to anchor a modeling methodology in it. These issues have been explored in several papers comparing BAT with DEMO (Reijswoud and Lind, 1998; Verharen, 1997) and Action Workflow (Goldkuhl, 1996; Verharen, 1997). There is an abundance of theories that are suitable for this purpose. In this paper we have chosen BAT as an example. Our primary purpose is to show how such anchoring can be done and not to argue for BAT as the "theory of choice".

Although the frameworks mentioned above are substantially different in many aspects they do largely agree on dividing a business process into phases. Among them BAT offers the most comprehensive phases:

1. Business prerequisites phase
2. Exposure and contact search phase
3. Contact establishment and proposal phase
4. Contractual or commitment phase
5. Fulfilment phase
6. Completion or assessment phase

The other frameworks address only a part of these phases and/or they give different names to the phases and/or they subsume several phases under one heading. Action Workflow, for example, uses the following 4 phases which roughly correspond to phases 3 to 6 of BAT:

1. Preparation

2. Negotiation
3. Performance
4. Acceptance

DEMO introduces 3 phases:
1. Order phase (actagenic or action-generating conversation)
2. Execution phase (essential action)
3. Result phase (factagenic or fact-generating conversation)

The first phase subsumes phases 3 and 4 of BAT, while phases 2 and 3 correspond to phases 5 and 6 of BAT, respectively.

As BAT is the most general framework and offers the most comprehensive phases it appears to be an ideal starting point for a business modeling methodology. But contrary to many others (and as already mentioned) it does not yet provide its own methodology. The author of BAT defends the corresponding decision with the "freedom of choice" argument (Goldkuhl, 1996) but this argument can be challenged as we have shown above (Introduction, second paragraph). As a consequence we suggest in this paper an outline of a modeling language for BAT as a first step towards a methodology.

The following sections are structured as follows: We first introduce the BAT framework and the generic layered patterns for business modeling. In the section "Refining the Framework" we combine phases and layers into one coherent framework and suggest a possible classification of business acts based on a material and speech-act analysis of the basic activities of BAT. We proceed by specifying the notational elements of a potential language; we finally present a possible application of such a language for the purpose of commitment analysis.

2 Business Action Theory

Business Action Theory (BAT) has been introduced by Goldkuhl (1996) and was refined and adapted on the basis of further empirical evidence in Goldkuhl (1998) and Goldkuhl and Lind (2004). It is based on Socio-Instrumental Pragmatism (SIP; Goldkuhl, 2002) that combines communicative (social) and material (instrumental) aspects of actions. One of the roots of BAT is Speech Act Theory (Austin, 1962; Searle, 1969) that views communication as action between (two) individuals, another one is the Theory of Communicative Action (Habermas, 1984), which puts action into a social context.

According to BAT business interaction involves two principal players, i.e. the supplier and the customer, where the former sells to the latter. At the core of BAT is the so-called business transaction that consists of the six phases which we have already mentioned in the previous section. Figure 1 gives a graphical overview of the framework. Goldkuhl (1996) identifies also a number of generic business actions that constitute the phases on the respective side of the transaction (i.e. supplier or customer). These actions are summarized in table 1.

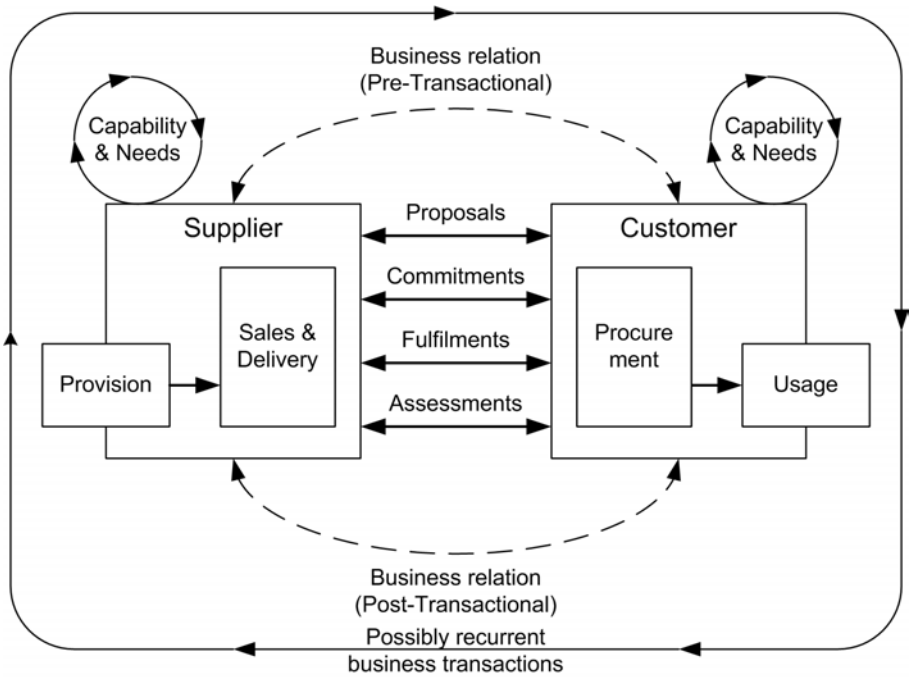

Figure 1. A Business Transaction in Business Action Theory (Lind & Goldkuhl, 2005)

Table 1. Generic Business Actions

Phase	**Supplier**	**Customer**
Prerequisites phase	Product/offer development	Identification of problems/needs
Exposure and contact search phase	Offer exposure	Contact search
Proposal phase	Offer	Inquiry
Commitment phase	Order confirmation	Order
Fulfilment phase	Delivery, Invoice, Receipt of payment	Receipt of delivery, Payment
Assessment phase	Acceptance, Claim	Acceptance, Claim

The business actions follow a certain execution logic but the whole transaction is by no means a linear, sequential procedure. In the proposal phase, for example, the supplier can make any number of offers concerning their products and/or services where each one will typically meet the customer's needs better than the preceding one. Likewise the customer can make a series of inquiries that usually become more and more "realistic". These loops terminate when offer and inquiry are sufficiently close to each other to reach an agreement whereupon we enter the contractual phase. In an ideal scenario this consists of the customer placing an order and the supplier confirming it. Both actions together constitute a contract the fulfilment of which is subject of the next phase. Here the supplier, again ideally, delivers the products/services and sends a corresponding invoice. The customer receives the delivery and makes the payment, which the supplier finally receives. In the completion phase each party decides whether they

accept the receipt of the delivery/money or make a claim, i.e. request the fulfilment of that part of the contract they consider unfulfilled.

Orthogonal to the phases BAT offers another dimension, layers, that was introduced in (Lind and Goldkuhl, 2001). They extend and modify the layers originally suggested by Weigand and van den Heuvel (1998). Layers refer to the granularity of an action and in BAT they are, from fine grain to coarse grain: business act, action pair, exchange, business transaction and transaction group. A business act is a communicative act (speech act, e.g. placing an order) or a material act (e.g. performing a delivery). It is directed towards somebody with the aim of changing the world, i.e. the material world or the mental world (state of mind) of the addressee. An action pair is a pair of actions where the first one is a trigger (initiative) and the second a response. Actions can have a dual function so the response of one action pair can be the initiative of another.

On the third layer an exchange consists of an arbitrary number of action pairs (but at least one). An actor gives something to another in return for something else. An exchange always concerns actions of the same type, i.e. a value is exchanged against another value (e.g. product against money) or a proposal is exchanged against another proposal (e.g. offer and inquiry). The fourth layer is called business transaction. It consists of a number of exchanges that correspond to the phases. There is an exchange of interests (contact search), an exchange of proposals (bidding), an exchange of commitments (contract), an exchange of values (e.g. products and/or services against money) and finally an exchange of assessments (claims or acceptances). A transaction starts when the (potential) customer has a need and the (potential) supplier has a corresponding ability (to satisfy the need). It ends when the need is (at least partially) satisfied or when the parties agree that this goal cannot be reached. In the latter case the actor in the customer role will search for a different supplier whereupon a new transaction begins.

On the fifth and final layer the same customer and supplier engage in a number of transactions over a longer period of time thus forming a stable business relationship (Axelsson et al., 2000; Goldkuhl and Melin, 2001). In the next section we elaborate the generic business actions with the help of a material and speech act analysis. We use the results of that analysis to develop a set of essential functions of business acts that can be basic elements of a language for BAT.

3 Refining the Framework

A methodology for BAT would have to take into account both dimensions, phases and layers. Strictly speaking, the phases are only a refinement of one particular layer, namely the transaction layer. On the way towards a methodology we also need a refinement of the other layers. Such a refinement is suggested in figure 2 with the exception of the transaction group layer. The transaction layer is divided into the exchanges (or phases) that have already been mentioned. An exchange consists of two handover actions: One is directed from the supplier to the customer and the other vice versa. These handovers usually happen one ofter the other where the second happens in return for the first but the order is not predefined, i.e. in some cases the supplier hands over first and in others the customer. In certain cases, e.g. if the parties do not trust each other, the handovers can be near-simultaneous as for example in "delivery versus payment".

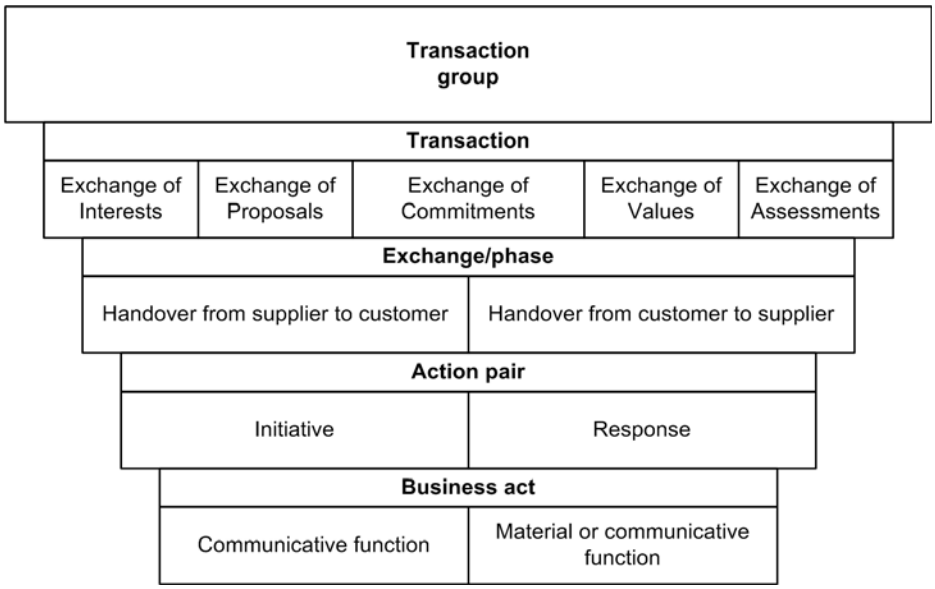

Figure 2: Structure of the Layers

An action pair consists of two business acts, an initiative and a response. They have already been introduced as trigger and response in (Lind and Goldkuhl, 2001). On the lowest layer a business act consists of one or more functions. The importance of these functions was already recognized in (Goldkuhl, 1996) where they were named mixed communicative actions. This suggests that a business act can be further divided into distinct, separate acts. But the mixed actions are rather different functions of the same act than different acts. We therefore prefer to call them the communicative and/or material functions of a business act. Goldkuhl (1996) gives the examples of (commercial) offer and order. A commercial offer can be a single business act that has two communicative functions,

a) that of requesting the potential customer to buy (i.e. to place an order),
b) and that of committing the potential supplier to sell (i.e. to deliver) under certain conditions.

These are two communicative functions that are often part of the same business act rather than two separate steps (i.e. distinct actions). The same holds for the order which has the functions of

a) requesting the supplier to sell (i.e. to deliver),
b) and committing the customer to buy under certain conditions.

If we apply the same kind of analysis, which we call material and speech act analysis, to the remaining generic business actions we get the results shown in table 2.

Table 2. Material and Communicative Functions of the Genereic Business Actions

Business Action	**Material and/or communicative function**
Offer exposure	*State* general offer
Contact search	*Express* interest
Inquiry	*Request* commercial offer + *Express* interest
Commercial offer	*Offer* delivery + *Request* order

Order	*Request* delivery + *Offer* payment
Order confirmation	*Promise* delivery
Delivery	*Transfer* merchandise/*Perform* service + *State* delivery
Invoice	*Request* payment + *State* contract fulfilment [supplier]
Receipt of delivery	*Accept* delivery + (*Accept* contract fulfilment [supplier])
Payment	*Transfer* money + *State* contract fulfilment [customer]
Receipt of payment	*Accept* payment + (*Accept* contract fulfilment [customer])
Acceptance	*Accept* contract fulfilment [supplier or customer]
Claim	*Request* contract fulfilment [supplier or customer]

These results show that a busines act typically has one or two functions. The communicative function is always present (even in the case of material acts) but there might also be another function that is either communicative or material. This is reflected in the model of figure 2. The generic business action "receipt of delivery or payment" can in some cases imply the acceptance of the contract fulfilment of supplier or customer, respectively. In other cases the acceptance is stated explicitly (i.e. separately in the assessment phase) or a claim is made (also in the assessment phase).

We are aware of the fact that such a list of generic actions and their functions can only serve as a recommendation that covers some typical or common situations. It is not meant to be a prescriptive template for all business interactions. The main purposes of it are rather as follows: First it should give an example of how material and speech act analysis can be used to identify material and communicative functions. Using that analysis in a different context might yield different actions and even different functions concerning the same actions. But the results can nevertheless be useful, and that is the second purpose, to find a set of recurring material and communicative functions that can be used as a pattern for a modeling language.

If we compile the identified material and communicative functions and sort them according to the illocutionary points introduced in (Searle, 1979), adding a column for material functions, we arrive at the structure show in table 3.

Table 3. Classification of material and communicative functions

<table>
<tr><th rowspan="2">material</th><th colspan="5">communicative</th></tr>
<tr><th>expressives</th><th>declaratives</th><th>assertives</th><th>commissives</th><th>directives</th></tr>
<tr><td>Transfer</td><td rowspan="3">Express</td><td rowspan="3">Accept</td><td>State</td><td>Promise</td><td>Request</td></tr>
<tr><td>Apply</td><td rowspan="2">Reply</td><td rowspan="2">Offer</td><td rowspan="2">Ask</td></tr>
<tr><td>Transform</td></tr>
<tr><td colspan="6">Perform</td></tr>
</table>

The material functions are transfering and object (i.e. moving it in space), applying an object as an instrument and transforming and object (i.e. changing some of its properties) possibly with the help of an instrument (this is in accordance with SIP). The function "express" is used to show an emotion or an attitude (e.g. interest in a product). A directive is usually a request in a business context. A less formal and less compelling directive would be to ask a question. The reply is the corresponding assertive. There is another assertive, state, that carries a higher illocutionary force. It is a unilateral establishment of a fact, whereas the declarative "accept" is a confirmation of a stated fact, i.e. a mutual agreement on that fact. An "accept" must therefore always be preceeded by a "state" because one party alone cannot declare agreement. The commissives are divided into promise and offer. The former is an unconditional commitment, the latter is subject to some conditions. If these conditions are fulfilled (typically by the other party) the offer becomes a promise. To avoid confusion of the communicative function "offer" with the same term as used in a business context we have called the latter a commercial offer. The function "perform" refers to a business act that is elementary at the current level of abstraction (i.e. with respect to the model under consideration) but a complex action on some lower, more detailed level.

The development of a set of material and communicative functions was motivated by (Lind and Goldkuhl, 2001) and (Goldkuhl, 1996). Both stress the importance of this issue (in the former paper it was called multi-functional business acts, in the latter mixed communicative actions). We agree with Goldkuhl (1996) that the illocutionary points of (Searle, 1979) are too coarse for business modeling and have therefore developed the set of functions in table 3 which is somewhat more elaborate and more adapted to business interaction. But nevertheless such a classification should be seen as a suggestion rather than a fixed template. Such a set might require adaptation to a particular modeling scenario.

A classification of speech acts has also been done by Reijswoud et al. (1999). They employed a purely theoretical method that consisted in viewing the one-dimensional classifications of Searle and Habermas, respectively, as two dimensions of a matrix. As a result they got the six speech acts question, answer, request, promise, state and accept. These are also found in table 3. Our classification can therefore be seen as an extension of that of Reijswoud et al. (1999).

Based on the suggested refinements, the next section develops a set of elements that describe the outline of a potential modeling language for BAT.

4 Language Elements

The development of a full-blown language or even a method is a huge project. Such a project is only justified if the new language or method really offers something substantially new. As we have mentioned earlier, there is already a number of methods that "implement" language-action concepts to some extent. We do therefore not propose a comprehensive new language but rather a set of elements that can, for example, be used to extend existing languages. The techniques for such an extension are offered by (situational) method engineering (Ralyté et al., 2003). The idea behind method engineering is to design methods in such a way that they fit the particular modeling situation. This can be done in different ways. One way is to extend an existing method. Another one is to create a new one from chunks of existing methods by performing method chunk selection and assembly. The third way is to construct a new method from scratch with the help of a suitable meta-model or paradigm. Using the first approach, method extension, we might for example enrich and refine the language of SIMM with the elements introduced in this section.

We propose that a business action language requires at least three element categories: actors, actions and (action) objects. As SIMM has the most elaborate concept of an action object, we borrow both the notion and the notation of an object from SIMM. Examples of information and material objects are shown in fig. 3 but SIMM offers many additional types. Actors are denoted by a rectangle containing the name of the actor as is common in many approaches. The actions themselves are divided into two categories according to the layer: business acts (layer 1) and the other layers. Actions on layers 2 to 5 are represented by a rounded rectangle with a double line. An additional classification symbol can be used to identify the particular layer: two intersecting circles for an action pair, two arrows pointing towards each other for an exchange, a "T" for a transaction and a "G" for a transaction group. For business acts in general we also use the rounded rectangle, for material acts the octagon. Both shapes have only one line to show that the act is elementary. The box can either contain the name of the business act or the respective material or communicative function where the function header is italicized. In the case of multiple functions the box can be divided into horizontal compartments, one for each function. If material and communicative functions are mixed we can also mix the respective shapes. Fig. 3 shows an overview of the notational elements for a business action language.

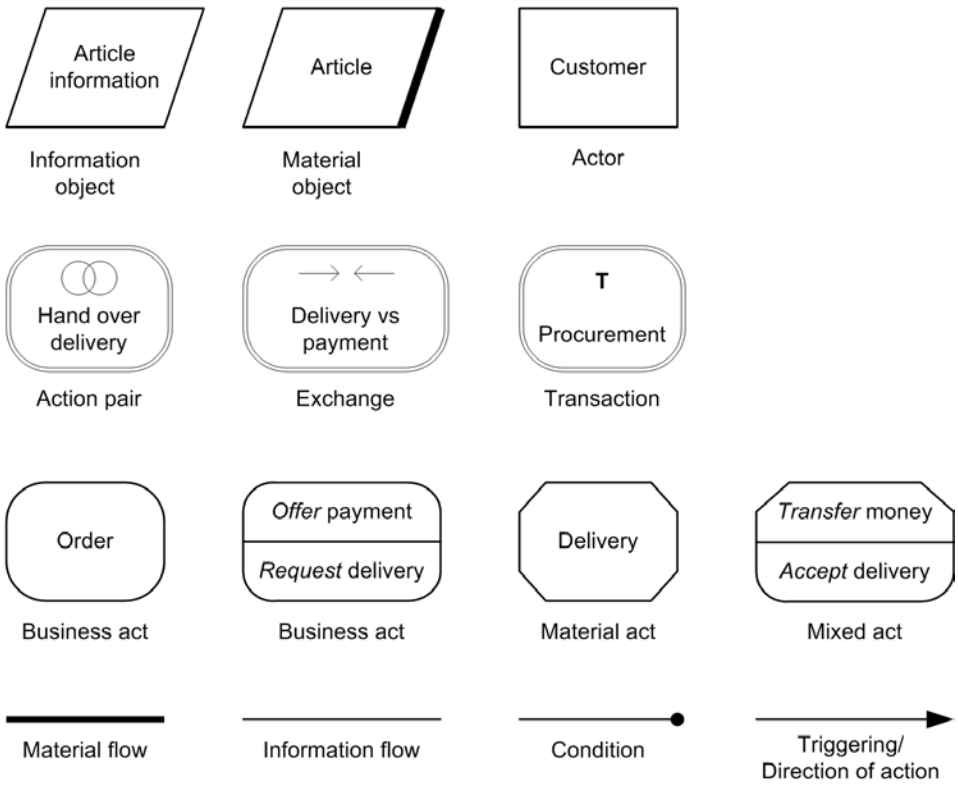

Figure 3. Notational elements for a business action language

Among the elements there are also four types of arcs. Two undirected arcs that represent an information flow (thin arc) or a material flow (thick arc). These have been borrowed from the SIMM Action Diagram where the direction of the flow is coincides with the drawing direction (from top to bottom). The condition arc allows us to show that one action is a condition for another action. The end with the black dot is attached to the latter action. The arrow serves two purposes. If it points from one action to another, the former triggers the latter. If it points from one actor to another, it represents an action that is directed from the first actor to the second. In this case the name of the action is written along the arrow. It can be accompanied by a symbol denoting the layer. For layers 2 to 5 we use the classification symbols introduced above. For communicative or material acts we use a small rounded rectangle (or circle) or a

small octagon (or diamond), respectively. As an alternative to the arrow form of the action the boxed form of the action can be interlaced with the arrow.

As an example for the use of these elements let us consider an extension of the SIMM Action Diagram by the refined action concept presented above. We call the result an Action/Object Diagram because it primarily contains actions and objects. In this new diagram we can still express all the information that the SIMM Action Diagram can capture but in addition we can also specify the action type (communicative or material), the layer and the communicative and material functions if we wish to do that (i.e. if the modeling situation requires that kind of information). A small example is shown in figure 4. It is taken from a business process that we have analyzed in the context of a project. The details of this project are given in the next section.

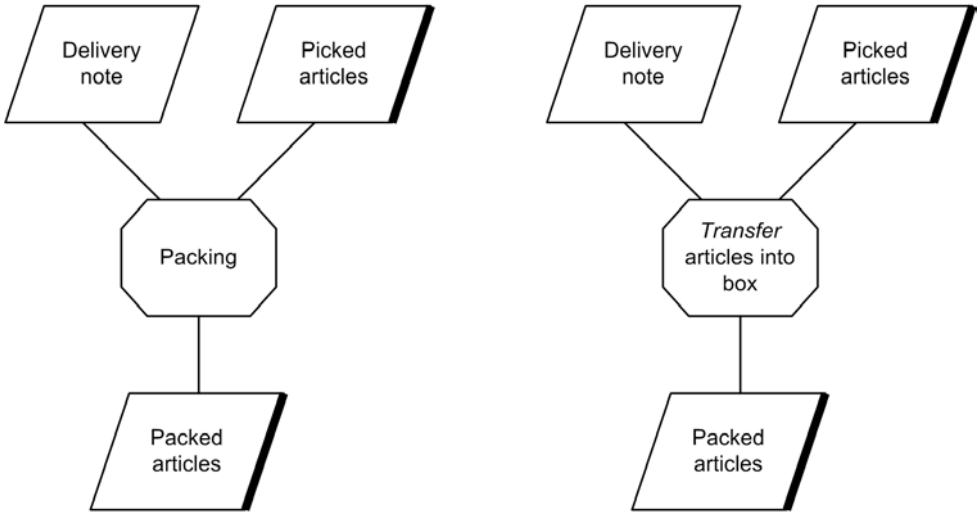

Figure 4. Example of an Action/Object Diagram

Figure 4 shows the packing of articles for delivery. We start with articles that have already been picked from the shelf. The thick line identifies them as material objects. The packing procedure is controlled by the information on the delivery note (information object) and the result of it are packed articles. The packing is primarily a material action. The octagon tells us that and that we consider this action elementary from a business view, which means that we are not interested in further dividng it into smaller steps (although these steps do, of course, exist). We could, alternatively, indicate that the packing is a transfer operation that moves the articles into a box.

The Action/Object Diagram is an example of how the new language elements can be used to extend an existing language (that of SIMM). But the main focus of this paper is not on the extension of SIMM. We rather use the language elements to define two diagram types that are suitable for analysing commitments and to help with detecting bad commitment management. The next section elaborates this issue.

5 Commitment Analysis

Commitment analysis in terms of language action was introduced by Auramäki et al. (1988). They used discourse analysis to develop a discourse graph, a conversation graph and finally a network graph of actions and commitments that shows in which way the actions influence the commitments. This helped them to discover flaws in the way that commitments are handled. Our aim is similar but we use business process analysis instead of discourse analysis as the point of departure. Our work has been carried out in the context of a project that involved two

companies that have a very close business relationship. One of them is the headquarters of a retail chain in the home textiles and decoration industry. The other is third-party logistics provider, let us call them LogPro, that performs all inbound and outbound logistics for the retailer.

Our goal was to discover the major problems in their relationship and to suggest appropriate solutions. For this purpose we carried out a thorough analysis of the relevant business process, order processing and delivery, that involved, apart from Headquarters and LogPro, also the shops of the chain which are organizations in their own right although they do maintain a very close, franchise-like relation with Headquarters. For the analysis of the interaction between these players we first used the Interaction Diagrams of SIMM. But then we discovered that we also need information on the type and level of an action so we enriched the Interaction Diagram with the features introduced above. The resulting diagram is shown in fig. 5.

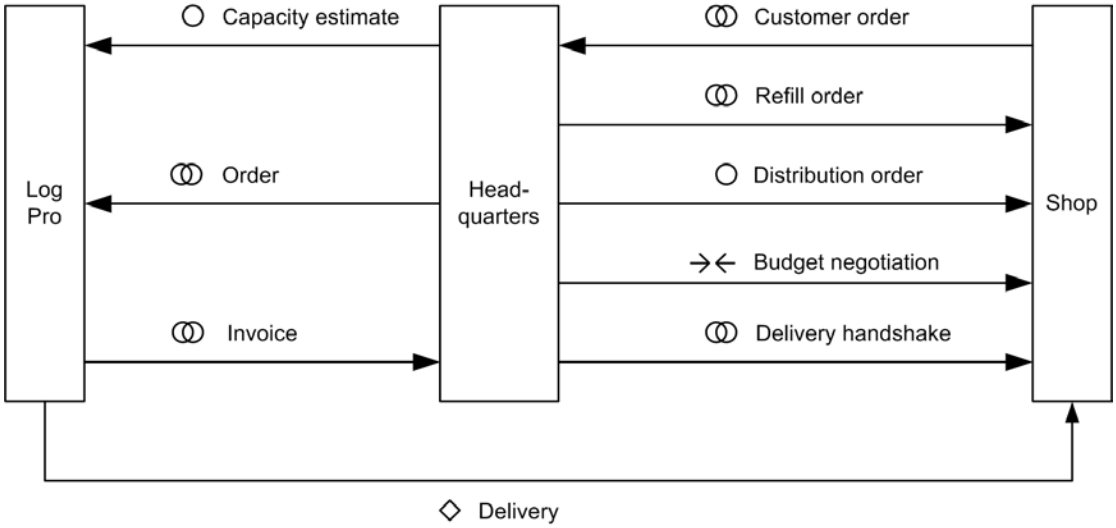

Figure 5. Enriched Interaction Diagram

The process starts when Headquarters send an estimate regarding the capacity required for executing future orders. Such estimates are send six months, two months and two weeks in advance of the time of delivery. Shortly before that time the Shop can place different kinds of orders. A customer order is iniated by the Shop on behalf of a customer who wishes to buy an article that is not currently available in the Shop. The refill order is triggered by Headquarters whenever the Shop's stock is running low on articles of the basic assortment. Both actions are on the action-pair level because they require some kind of confirmation from the partner. The third type of order is called a distribution order. It is based on the budget that was negotiated before and the shop has to accept it as part of its franchise obligations. The distribution order is therefore only a single speech act that has a more informative character. The negotiation of the budget on the other hand is a bilateral process that is initiated by Headquarters but consists of an exchange of budget proposals.

Orders of all types are combined into one order by Headquarters and forwarded to LogPro. As a consequence LogPro will perform the delivery to the Shop. Headquarters inform the Shop about the upcoming delivery and receive a confirmation that is has arrived (delivery hand-shake). In regular intervals LogPro bill their services to Headquarters.

On the basis of this overview we developed detailed Interaction Diagrams for the interactions between Headquarters and Shop as well as between LogPro and Headquarters. The latter is shown in fig. 6. This diagram is on the business-act level, i.e. all actions in it are business acts. It shows that Headquarters send a capacity estimate first. On the day of delivery a pick

file is transferred to LogPro that contains the order data. This is used by LogPro to pick the appropriate articles from the shelves and to pack them for delivery. As soon as the articles are on their way, LogPro reports the delivery to Headquarters. At the next billing occasion LogPro send an invoice and Headquarters makes the respective payment.

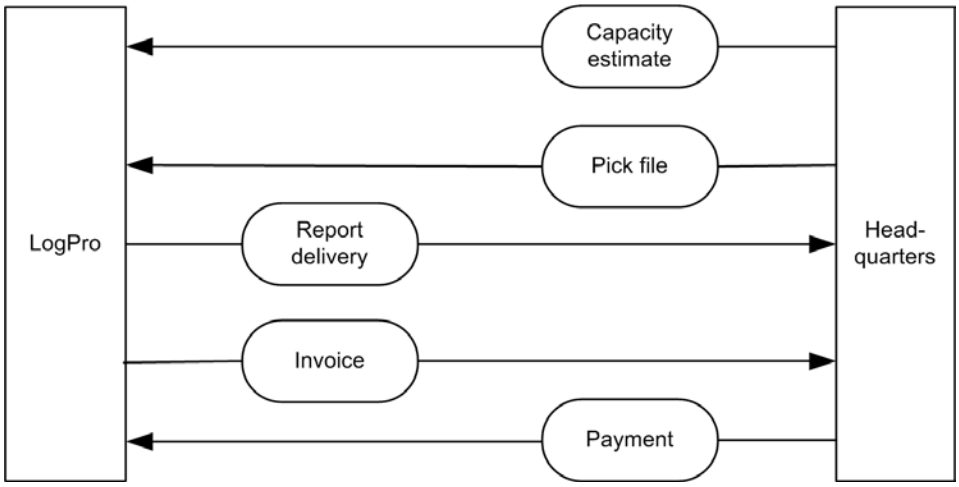

Figure 6. Detailed Interaction Diagram

For performing a commitment analysis we need more detailed information about how the actions are related to each other. This means that we have to exhibit the communicative and material functions that the actions have. These functions are the ones that lead to the establishment or fulfilment of commitments. When they have been made explicit we can show the conditional and causal relationships between the functions. This in turn helps us to uncover broken commitments. For this purpose we have created a new type af diagram, the Business Act Diagram. A diagram of this type for the relation between LogPro and Headquarters is shown in fig. 7.

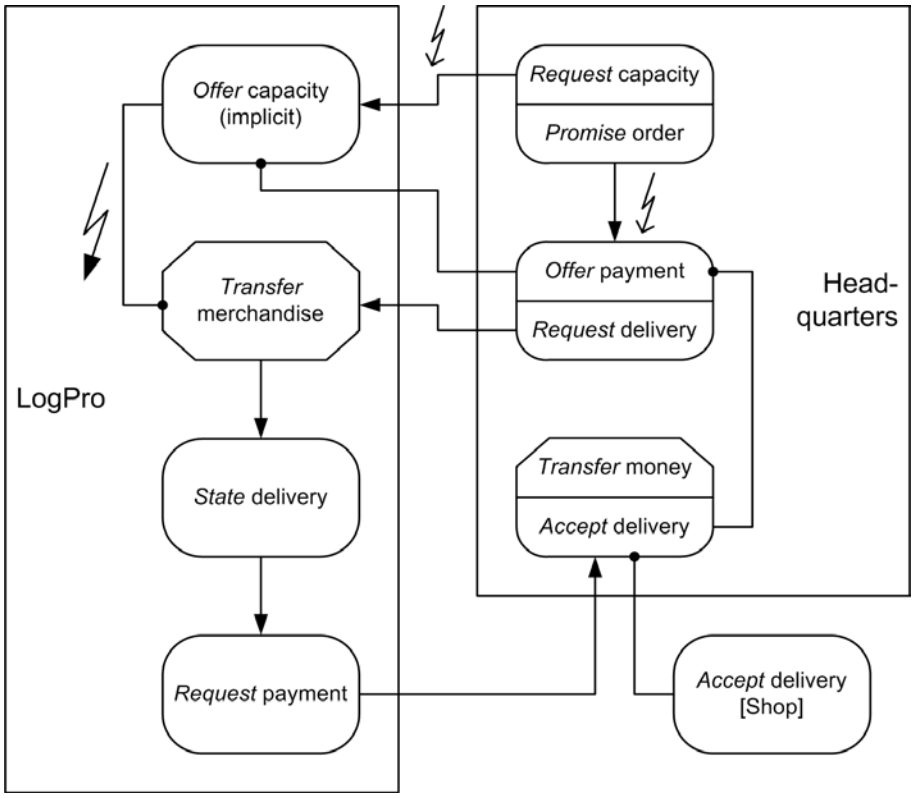

Figure 7. Business Act Diagram

Each actor box covers the actions that are performed by this actor. The capacity estimate is an action that implies both a request to provide this capacity and a promise to place an order that requires approximately the requested capacity. LogPro makes an offer to provide this capacity subject to Headquarters' order in general and their offer of payment in particular. This offer is implicit (i.e. not communicated) because LogPro is required to provide the respective capacity by the terms of the frame contract. The provision of the capacity is a condition for the ability to perform the delivery that is triggered by the respective request from Headquarters that is a function of the order. The other function, offer payment, is subject to an accepted delivery. The performed delivery triggers a respective report (state delivery) which in turn triggers the invoice (request payment). The latter triggers the payment (transfer money) but only if the Shop has confirmed the arrival of the delivery. Headquarters does not explicitly accept the delivery towards LogPro but does so implicitly by paying the invoice. Therefore "Transfer money" and "Accept delivery" are functions of the same business act.

The Business Act Diagram has clearly shown us that the commitment concerning the capacity is broken in three different places (see the flash symbols in fig. 7):

1. Headquarters promise that the order will require the capacity that was requested. But in reality the orders often deviate substantially from the estimates.
2. The request for the capacity is not in a for LogPro suitable format so that they can hardly plan for providing this capacity. But Headquarters assume that the capacity is provided.
3. As a consequence of 1 and 2 the condition for performing the delivery are not given in many cases. This leads to higher costs and sometimes failure to meet the deadlines for delivery.

We have used this approach for other parts of the business process where we also succeeded in finding mistakes in commitment management. Among the problems we have identified this way are:

1. Broken patterns: One important characteristic of a business transaction is that each business act is related to another in a pattern of initiative and response. This means that the sequence of business acts needs to be followed in the sense that the pattern should not be broken. Going back to the empirical setting it can be identified that Headquarters supply estimates (as an initiative) without getting a response. There is thus a pattern of interaction when establishing the framework contract and another one when realizing the business transaction. The interaction pattern that glues framework contract and business process is thus broken. This has the effect that Headquarters cannot be sure of the capacity that will be available at the time of order and LogPro does not reserve the required capacity. The estimates made by Headquarters are therefore neither informative nor directive and hence do not imply mutual commitments. As a consequence, the contract should be specified in such a way that encourages the parties to keep the patterns intact.

2. Business rules: There are no rules that guide the interplay between the overall framework contract and the embedded business transactions. Such rules are necessary to regulate the details of interaction and to provide infrastructural support such as IT systems.

3. Indistinct communication structures: It was often unclear who communicates with whom regarding which issue. This led to excessive communication with the result that a considerable amount of time was wasted on solving minor everyday issues. This was only necessary because of the insufficient specification of routine procedures in the framework contract.

4. Lack of trust: Different interpretations of the framework contract by the parties led to misunderstandings and expectations that were not fulfilled. This caused in turn a lack of trust in the succeeding transactions which made the cooperation more and more difficult.

5. High transaction costs: Ad-hoc solutions to exceptional problems increased transaction costs. This was in part also due to missing business rules (issue 2) for situations that only occur occasionally but are not unforeseeable (e.g. out of stock). As such situations had not been provided for they required substantial effort at the time of their occurrence.

6 Conclusion

Business Action Theory is a stable framework for analysing business processes. It can guide the modeler in finding appropriate abstractions of the studied process and in relating different parts of the model to each other. This is accomplished because BAT is not only rooted in action research but also in an ontology of socio-instrumental action called Socio-Instrumental Pragmatism (Goldkuhl, 2005) that provides a deeper understanding of important aspects of social behaviour in general and business behaviour in particular. Other cornerstones of BAT are the existence of different dimensions, layers and phases, and the multi-functionality of business acts. All these features contribute to better business process models. But the support of the modeler can be strengthened by providing a modeling language that reflects these features of BAT. We have suggested a number of elements of such a language and we have shown two ways in which they can be used: to extend exisiting modeling methods (e.g. SIMM) and to define new diagram types that are adapted to a particular modeling situation.

As an example for such a situation we have used the analysis of commitments that are created and fulfilled (or broken) in the course of a business process. An enriched Interaction Diagram and a Business Act Diagram, two examples of newly defined diagram types, have proved useful in this context. But the language elements are only a first step towards a language. The further development of such a language depends on whether they can also be used in other contexts. This is subject to future research.

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