

## **GENERIC BUSINESS FRAMEWORKS AND ACTION MODELLING**

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### **Abstract**

The communicative action perspective of business processes and information systems has attracted much attention recently. A viable approach in this area is: Action Workflow. This paper investigates the use of Action Workflow as a generic business framework, relating it to the alternative Business as Action game Theory. The latter provides a more exhaustive description of various business actions. Action Workflow is also related to the SIMM approach with Action Diagrams, an action modelling method. A communicative action expansion of this method is suggested in this paper. A discussion is performed concerning the relations between generic business frameworks and action modelling methods.

### **1 Introduction**

There is a growing interest in understanding business processes and information systems from a communicative action perspective. Many researchers and practitioners recognize that it is not enough to view data flow and its control when redesigning organizations and developing information systems. An "information factory" metaphor of an organization has its severe restrictions, since - when focusing data objects and data flows - it tends to neglect human actors and their action and co-action. A communicative action framework puts human actors and action in the foreground when looking at organizations and information systems. Such a framework emphasizes that information does not only have a content (words, numbers and other symbols) but also an action aspect. Information says something about something; but what is stated, is uttered by someone (a "speaker") to someone else (a "listener"). Information cannot be excluded from human agency.

Theories of speech acts and communicative action (e.g. Austin, 1962, Searle, 1969, 1979; Habermas, 1979;1984) have been a source of inspiration for establishing a new framework for information systems (IS) in organizations. There have been many contributors for this attempt to challenge the prevailing mechanistic and objectivistic "information factory" paradigm. There is a seminal paper by Flores & Ludlow (1980) later followed by an influential book by Winograd & Flores (1986). Other theoretical contributions in this directions are made by e.g. Goldkuhl & Lyytinen (1982, 1984), Goldkuhl (1984, 1995), Lyytinen (1987) and Winograd (1988ab). Early contributions concerning communicative action approach to IS were mainly theoretical in nature. Only fragments of methodological

procedures were presented. Later on there has been a growing interest in how to translate communicative action theory on IS into development and design methods. The most well-known approach is probably Action Workflow which also consists of supporting software for analysis, design and implementation (Action Technologies, 1993). Another method in this connection is SAMPO by Auramäki et al (1988). Lee (1992) has presented an approach where Petri Nets have been expanded with communicative action concepts. Cf also Johannesson (1995) for a speech act based approach to information systems design.

The communicative action perspective can also be related to the growing interest into business processes in approaches as Business Process Reengineering (e.g. Hammer & Champy, 1993; Davenport, 1993) and Total Quality Management (e.g. Ishikawa, 1985). In such approaches the main focus lies on redesigning organizations as business processes. In BPR radical transformation is preferred and in TQM continuous improvement is preferred. There seems to be a general agreement on the notion of process as a structured collection of activities performed in order to satisfy an (internal or external) customer. The process view of an organization is a *horizontal* view on it, emphasizing *what is done* in order to satisfy its *customers*. In spite of this general agreement on the business process notion, there seem to be great variations in how the process notion is applied in analysis, definition and redesigning in different organizations. Davenport (1993) accounts for different cases showing problems with how to delimit processes. "Considerable controversy revolves around the number of processes appropriate to a given organization. The difficulty derives from the fact that processes are almost infinitely divisible" (ibid p27). In my opinion these difficulties seem to derive from unclear criteria for delimitation, and thus from an unclear business process theory. Communicative action frameworks can contribute with theoretical clarity to the business process concept and how to delimit processes. Frameworks as Action Workflow are important for this kind of theoretical clarity, which has been acknowledged by Keen (1991).

The purpose of this paper is to investigate communicative action oriented approaches to business and information systems modelling. This investigation will be performed on two related levels:

1. a theoretical/conceptual and
2. a methodological modelling level.

Keen (1991) has argued that it is important to embed the new thinking of "total quality", "customer satisfaction" and "business process" in methodologies, otherwise these notions will just be clichés. I will study Action Workflow, as a prevalent conceptual and methodological approach of this kind, and relate it to another generic business framework and another action modelling method. In section 3 below I present an alternative business action framework and relate it to Action Workflow. In section 4 I am presenting and discussing an alternative action modelling method (Action diagrams of SIMM). This method is here extended with explicit communicative action features and it is briefly compared with Action Workflow. In this short paper it is not possible or meaningful to investigate further methods. More arguments for selection and features of these approaches are to be found in section 3 and 4 below.

This paper should be seen as a contribution to the theory and method of language/action in information systems. I have made characterizations and comparisons between frameworks respective methods. Through such comparisons new knowledge can be gained in an inductive way.

## **2 Action Workflow**

Action Workflow has been developed by Fernando Flores and associates, relying on previous theoretical work (Flores & Ludlow, 1980; Winograd & Flores, 1986; Winograd, 1988ab). Action Workflow (e.g. Action Technologies, 1993; Denning & Medina-Mora, 1995) describes work consisting of two main roles and four phases. The two roles are:

- customer
- performer

The performer performs work according to a request made by the customer. The Action Workflow loop (illustrated in fig 2.1) consists of four phases:

- preparation
- negotiation
- performance
- acceptance

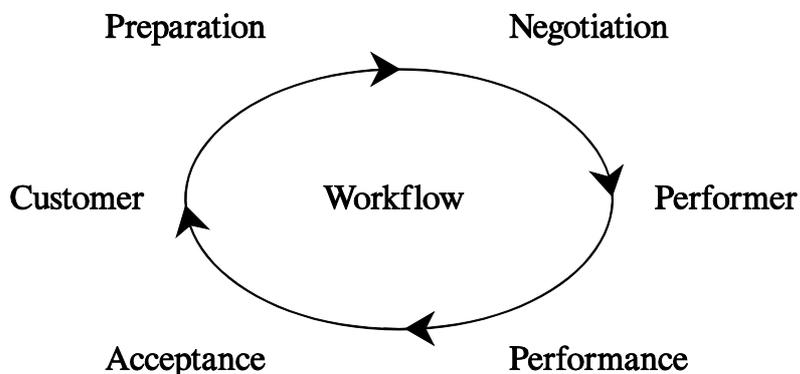


Figure 2.1 Action Workflow (from Action Technologies, 1993)

In preparation the customer proposes (by a request) a work to be done. Alternatively, the performer can offer a work to be done to the customer. In negotiation the customer and the performer come to an agreement about the work to be performed. The next phase consists of the performance of the work and report of its completion made by the performer. The acceptance phase means that the customer evaluates the work and declaring satisfaction or dissatisfaction.

Action Workflow can be seen as

- a theory (a generic business framework)
- an analysis and modelling method
- a supporting software tool

These three parts are closely linked to each other. The Action Workflow theory (with its roles and phases) can be seen as a generic blueprint for how to organize work.

### 3 Business as action game

### 3.1 An alternative generic business framework

Action Workflow can, as mentioned above, be seen as a generic business framework. It is a framework emphasizing the action aspect of doing business. This framework has certain merits. I will however present another generic business framework since there are parts of Action Workflow, which I am not fully satisfied with. This alternative framework I call: *Business as Action game Theory*. I will first present this framework and later compare it with Action Workflow. In this comparison I will then argue for different features of the alternative framework. Parts of this framework has earlier been presented in Goldkuhl (1995).

Business as Action game is graphically illustrated in figure 3.1. This generic framework is strongly influenced by communicative action theories. There are two parties involved in a business transaction: A supplier selling and a customer buying. What does this selling and buying mean from a communicative action perspective? There are different actions performed in a business transaction. There are communicative actions and "material" actions (as e.g. delivering physical goods and paying). It is obvious that the communicative actions of a business transaction are not mere information transfer. There are e.g. requests and commitments made, which change the relations between seller and buyer. There is a determining difference between a refusal and an acceptance to an offer.

The different actions cannot be seen as isolated. They get their meaning from the business context: The roles and relations of the parties and the other business actions and the total "action logic" of the business transaction. Figure 3.1 is an attempt to describe this action logic in a generic way. I have borrowed the notion of language game (Wittgenstein, 1953). The language game notion is powerful to describe communication as actions performed and interpreted according to different intersubjective rules. There are rules for single acts and for relations between different acts and for an insitutionalized communication (consisting of different acts) as a whole. A business transaction is not only a language game. It involves material acts also. I call a business transaction an action game, since it involves both communicative and material actions. Material actions have a communicative character; the delivery of physical goods are in itself informative of the delivery. But I will not reduce this to only communication!

One important point, which is not duly recognized, is the *mixed communicative action* character of some generic business actions. An offer is not only an attempt to influence a potential buyer (a purchase proposal). It is also an expression of willingness to sell under certain conditions. When making an offer one makes a mixed communicative action; in this case both an attempt to influence the future actions of the receiver and a commitment of own future actions. An offer means that someone says both:

"I want you to buy this product"!

"I will sell this product to you under these conditions".

An order is a corresponding mixed communicative act:

"I want you to sell this product"!

"I will buy this product from you under these conditions".

Using the classification of Searle (1979) these two acts are both a *commissive* and a *directive*.

There are certain action conditions necessary for establishing a business transaction (figure 3.1). There must be an *offer* by the supplier and *order* by the customer. The offer and the order together form a *contract*. Such a contract is a *mutual commitment*; i.e. a supplier commitment of delivery and a customer commitment of payment; sometimes also commitments of other related business conditions. The supplier's offer is based on a *capacity* and a *know-how* to produce and sell offered products. When I talk of products I mean material products or immaterial products (i.e. services) or, as in many cases, a combination of

these product types. The offer can be available (standard) products or based on a potential to produce more customer tailored products. The purchase interest (of the possible customer) in the supplier's offers is based on some *needs*, which in turn can be based on problems and objectives within the customer.

In many cases there is a *negotiation* process between the supplier and the customer. An inquiry-based offer can lead to new questions and then a new offer and so forth. There can be a bidding with offers and counter-offers. The negotiation process can in more complex situations also involve an elicitation of customer needs and also an investigation of the available and possible supplier product capacity and know-how. This negotiation process will be brought to an end by a definitive rejection of the offer or an acceptance of an offer (an order). In the latter case there will be a contract between the supplier and customer expressing mutual commitments (as described above). It is important to see that the commitment made by the supplier (in the order confirmation or the contract or even in the initial offer if no specific confirmation or contract is made) are commitments of both future action and non-action. The supplier will deliver the specified products and invoice them accordingly. The supplier will *not* demand payment deviating from an agreed amount.

The latter parts of the business process involve *fulfilment of commitments* (delivery and payment) and related communicative action like *invoicing*. The invoice is a request of customer fulfilment of payment commitment. The delivered products will be used by the customer and this can lead to *customer satisfaction* or *dissatisfaction*. There is also a *supplier satisfaction* when receiving the payment. This is in business settings a necessity for carrying on the business activity. If the customer is not satisfied (i.e. there is perceived difference between the supplier's commitments and fulfilments), there might be claims towards the supplier. If the supplier does not get paid there will be payment claims.

*The business transaction is an interchange process between supplier and customer and it involves the creation and sustainment of business relations.* There are different phases in this interchange process. I have made a division into four phases, similar to the Action Workflow framework:

1. Proposal phase
2. Commitment (contractual) phase
3. Fulfilment phase
4. Completion (acceptance/claim) phase

The first phase can in turn be divided into three subphases: 1a) The development of offers (and corresponding products) together with identification of potential market and customers can be seen as the initial stage by the supplier. Corresponding identification of problems and needs leading to purchase interest by the customer is also part of the initial stage of the business transaction process. I call this initial stage the *business identification* phase. 1b) The offers (the capacity to sell actual products) must be communicated to potential buyers. There must be an exposure of offers and a search for contact with potential customers. The customer can in a similar way try to get into contact with potential suppliers. I call this second stage: *Exposure and contact search* phase. 1c) After finding each other the supplier and customer must establish contact and exchange their business possibilities and expectations (offers and inquiries). I call this the *contact establishment and negotiation* phase.

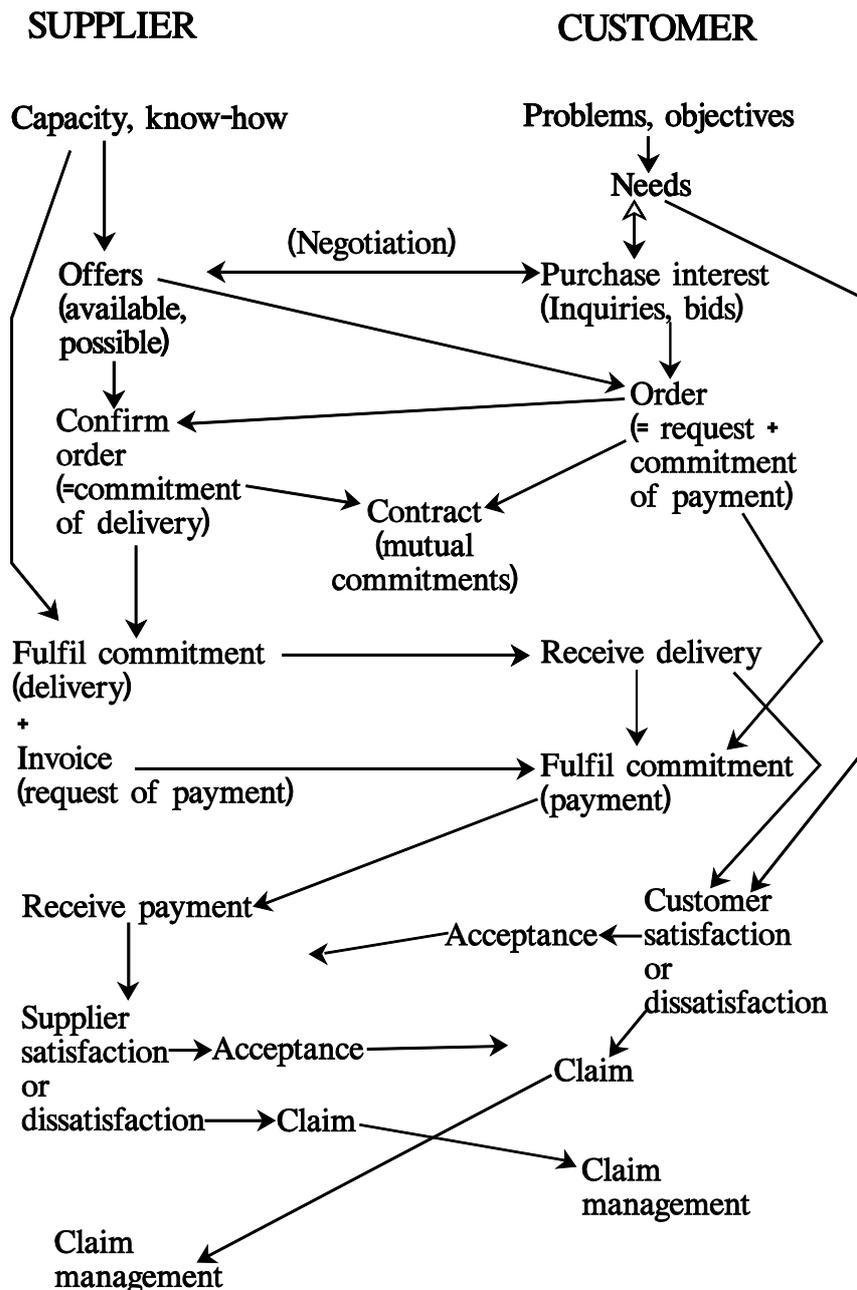


Figure 3.1 Business as Action game - an illustration of the generic business framework

An important comment to the framework: The described pattern of different business acts is ordered in a specific way (figure 3.1). I have described a principal (generic) pattern in the model. It is important to remark that this order can be altered otherwise in specific business transactions. E.g. there might be payment in advance which precede the delivery of products. It is also important to state that the different acts described in the framework do not need to be made explicit. In many cases there will be no explicit writing of a contract. An order and a order confirmation will together form a contract many times. In some cases there might be oral mutual commitments followed by hand shaking, a culturally dependent way of expressing commitments. In even more simpler business transactions (like buying a newspaper at a news-stand) the contract is made implicit in the order process, which can also be made rather implicit in the fulfilment of commitments (taking out a newspaper and putting

some money on the desk). This means that in simple cases (as e.g. the immediate purchase of articles in a shop) some of the generic acts within the business transaction are made implicit and taken for granted. This is also a way of decreasing the transaction costs on both sides.

### 3.2 A comparison

First I will state that Action Workflow and Business as Action game share the same theoretical basis; i.e. communicative action theory. There are more similarities than differences. In this section I will try to put forth some differences and discuss the reasons for the deviating features in the Business as Action game Theory (BAT).

Action Workflow is intended to be a more general framework. It can be used for all kinds of work including a customer and a performer. The notion of customer is used both as an ordinarily external customer and as an internal customer; i.e. the recipient of the result of a work process. BAT is restricted to business transactions between companies. It is not intended to be used describing internal relations within a company. It is intended to describe the circumstance consisting of genuine business relations between different parties. These different application domains have an impact on what is focused on in the two frameworks.

There is a difference in the general character of the frameworks. I would like to call Action Workflow a "one-way around model". It starts (generally) with customer request, and through the performer's commitments and work, it ends up with customer satisfaction (fig 2.1). BAT emphasizes the mutual character of the business transaction. It is an *exchange* process with *mutual* commitments, fulfilments and satisfaction. I would characterize it as a "two-directions co-action model". There is co-action in ActionWorkflow, but the essence of this generic model is a workflow from customer via performer back to customer.

In Action Workflow there is a focus on communicative actions, and an emphasis on commitments. One example of this communication emphasis can be found in the description of the performance phase. Here the communicative action of reporting completion is stressed (e.g. Action Technologies, 1993 p29). To me, this is an overemphasis on communication. The most important is of course the (often material) actions performed leading to the delivery of products (goods and/or services). In many situations there is no separate message of delivery. The delivery itself has an informative character to the customer. BAT tries to catch the wholeness of the business exchange logic in a generic sense. It comprises a wholeness of communicative and material actions which builds up the business logic. It also has a broader focus on business actors. Action Workflow has a typical customer focus. To me this is theoretically asymmetric. I would like to emphasize both parties in the business transaction process; i.e. a customer and supplier focus.

I find Action Workflow and similar approaches as rather *one-sided* in their customer emphasis. I ask where the commitments and the fulfilment of commitments by the customer and also the satisfaction of the supplier are to be found? To me it is important to make a *symmetric framework with clear definitions of the actor roles of both supplier and customer*. This is not to be conceived as a denial of the need for customer focus. I am fully aware of the importance of having a customer focus in design, manufacturing and marketing of products. I claim however the importance of not disregarding essential acts and aspects of the business process and the need for the mutual satisfaction of the supplier and the customer. It is important to let the supplier be visible too! To disregard the commitments of the customer is to cut away necessary parts of the business transaction, and, hence, reduce it from its generic business character. *The business transaction is built from the business interchange relations and the different business acts which must be formed in a communicative congruent pattern.*

The business exchange orientation of BAT implies another scope. This framework starts earlier than Action Workflow with business identification and contact search. It includes also more generic actions in the later parts. The two-directions co-action character of BAT involves description of customer fulfilment and supplier satisfaction and possible mutual claims. These important generic actions are missing or implicit in Action Workflow.

The broader focus and scope of the Business as Action game Theory implies a more complex framework. Action Workflow is simpler and perhaps more easy to grasp; at least initially. The more semantic richness of BAT has these disadvantages of complexity. The framework can however be presented in a more abstract and condensed form (fig 3.2). Presented in this way, it competes with Action Workflow in simplicity.

I have summarized the differences between Action Workflow and Business as Action game Theory in a table (fig 3.3). I will here once again emphasize that there are more similarities than differences between the two frameworks. BAT owes Action Workflow for theoretical inspiration. I have tried to point out differences in order to explain why I have found it motivated to develop an alternative framework.

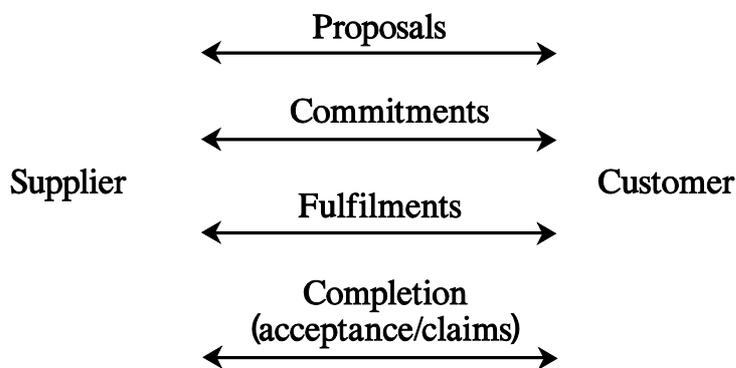


Figure 3.2 A simplified version of Business as Action game

	<b>Action Workflow</b>	<b>Business as Action game</b>
<b>Application domain</b>	All kinds of work	Business transactions
<b>Focus - general</b>	One-way around model (from customer via performer back to customer)	Two-directions co-action model (mutual commitments & fulfilments)
<b>Focus - actions</b>	Communicative actions; especially commitments	Wholeness of communicative and material actions and their business logic
<b>Focus - actors</b>	Customer focus (asymmetric)	Customer - supplier focus (symmetric)
<b>Scope - beginning</b>	Starts later; with proposal	Starts earlier; with business identification and contact search
<b>Scope - end</b>	Important generic actions are missing or implicit	Includes customer fulfilment and supplier satisfaction and possible mutual claims
<b>Complexity</b>	More simple	More complex

Figure 3.3 Action Workflow and Business as Action game - a comparison

## **4 Action modelling with SIMM Action Diagrams**

### **4.1 Generic business frameworks as basis for action modelling**

In Action Workflow there is a close correspondence between the conceptual framework and the modelling method. Action Workflow has let its framework (roles and phases) be transparent in the modelling method. As I understand, the resemblances, between the generic model and the modelled workflow maps, are a way to ensure that the Action Workflow framework is used when performing business modelling. This seems to be good principle but it is not unquestionable. This close tie makes it harder to combine this approach with other frameworks/methods.

Is it always desirable to use a strong framework (like Action Workflow) when analysing business processes? Are there situations where such a framework should be modified or (partly) replaced? Is the Action Workflow framework detailed and expressive enough for modelling different business situations?

I have presented an alternative business action framework in chapter 3 above. As can be understood, I do not regard Action Workflow as a framework exhaustive enough. This means that I do not consider it sufficient as a basis for a modelling method. I would rather adhere to a principle of not having a one-to-one relationship between the framework and the modelling method, since it seems to obstruct combinations of different methodological approaches. This does not mean a denial of the great importance of letting a conceptual framework penetrate its supporting methods. It is just a warning not to confuse theory with the method of modelling .

Instead of developing a new method adapted to the BAT framework (as in the case with Action Workflow) I have used an existing powerful modelling method and enhanced it with new features emanating from BAT. I am using Action Diagrams from the SIMM method (Goldkuhl & Röstlinger, 1988; Goldkuhl, 1992). This is a method for business modelling in different situations (e.g. reconstructing existing practice; designing new work solutions).

This implies that there is not as close link between BAT and SIMM as there is between framework and method in Action Workflow. The framework of BAT is not enforced in the same strong way as it is in Action Workflow, which can be seen as a disadvantage.

### **4.2 A communicative action expansion of Action Diagrams**

This modelling method has a material and information flow orientation. As such it is appropriate for business process modelling. It emphasizes the acts performed and the performer. The performer can be a person, a group of persons (e.g a department) or some adequate equipment (e.g. a computerized information system). What is done by the information system is considered as (predefined) actions within a business process. The performer concept is here used in a more general way than in Action Workflow. Performers are all those who performs actions, including customers and producers.

The basic modelling elements are found in figure 4.1; for more details confer Goldkuhl (1992). Some parts of the notational rules are included in appendix below. Actions are performed based on some prerequisites (basis for action), which can be of physical nature or information. Actions are performed by performer. Results of actions can be action objects of physical or informational character. Producing an information action object means

communicative action. Another important part of Action Diagrams is the semantic power to describe action logic. It is possible to describe

- sequential order of actions
- alternative actions (decision points)
- conjunctive actions
- contingent actions (i.e. actions occurring only sometimes)
- trigger (initiation) of actions (by time or communication)
- interruption of actions (by time or communication)
- conditions for action
- parallel actions

In Action Diagrams there has not so far been any distinction in information between its contents part (proposition) and its action (performative) part. To be used within a communicative action framework (e.g. BAT) it is important to be explicit about the (communicative) action character. I have here added such descriptive possibilities to Action Diagrams. The action character is described in italics before the contents part.

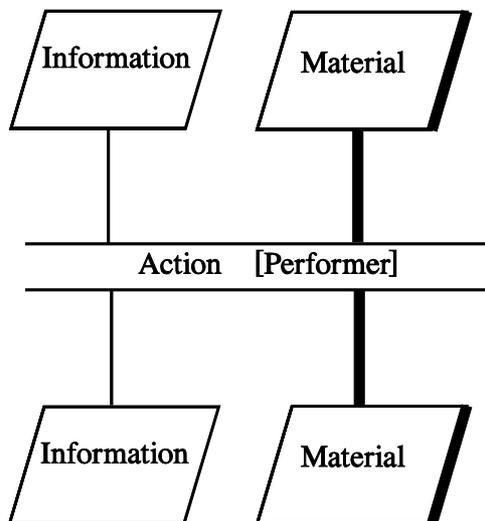


Figure 4.1 Basic description elements in Action Diagrams

How is this action characterization made? One approach is to have a defined set of action classes and then chose one of these classes for action characterization. One such possibility is to use an established classification scheme; e.g. the five illocutionary classes by Searle (1979); assertive, directive, commissive, declarative and expressive. This approach is not preferred here. I have not made a delimitation to a predefined set of action classes. Such an approach seems to be too restricted in semantic expressiveness. It is also highly dependent on the maturity level of the theoretical basis. To my opinion there is still a god deal of theoretical controversy about communicative action classes to be solved. Instead of a predefinition approach, the modeller can choose an appropriate action denotation. Of course a communicative action framework is important to rely on as a guide and a source for inspiration. The BAT framework and its underlying theoretical orientation should be used as a basis for this kind action modelling.

In figure 4.2-3 there are two Action Diagrams presented. As can be seen there is a clear flow orientation, but this is combined with an action orientation. To me a flow aspect

(i.e. sequences between acts) is one part of an action game. The action game concept implies possibilities to describe actions and action logic (including sequences/flow). The example is an business process in a company selling and producing some steel products. I have used an example from a real life project. I have made some simplifications for reasons of presentation and I have also, which is more important here, added description of action types to the Action Diagrams.

This action expansion makes it easier to analyse the business logic. E.g. what different actions are expected subsequent to an offer or to an order or if a commitment cannot be fulfilled? The original descriptive features of Action Diagrams (the modelling of information and material flows) are also important for understanding the business logic. E.g. it is not possible to exclude the material actions and flow from the descriptions without "destroying" the business logic. The communicative and material actions and their relations build together a wholeness of a business process; cf section 3.1 above. Business process modelling cannot just be of modelling of information.

The two Action Diagrams are related to each other in accordance with the notational rules. They compose two subcontexts describing parts of a business process. The modelling approach is contextual as opposed to compositional top down modelling (Goldkuhl, 1992).

There are some important differences between Action Diagrams and Action Workflow maps. A thorough comparison between Action Diagrams/SIMM and Action Workflow goes beyond this paper. Only a few comments will be included.

The different phases of the business transaction (cf section 2 and 3 above) are not distinguished explicitly in the Action Diagrams as they are in Action Workflow. As can be seen from the Action Diagrams, it is however rather obvious how the business process "passes" through different phases. The BAT framework and its different phases have been used as a theoretical lens during reconstruction and modelling. It has been used as a conceptual basis in a rather free fashion in modelling and not strictly imposed as in Action Workflow. As has been said earlier the conceptual framework of Action Workflow (phases and roles) is used in a descriptively forceful way during modelling. Hence Action Diagrams seem to be more appropriate to use in situations when reconstructing a diffuse practice deviating from an ideal business action pattern. In Action Diagrams it is possible to describe many different variations of business/action logic.

In Action Diagrams, one explicitly distinguishes between material flow and information flow. There is also a more clear distinction made between actions and different action objects (the basis and results of actions). The action logic is treated in different ways in the two notations. In Action Diagrams it is possible to have a detailed description of the action logic. The expanded Action Diagrams can be seen as an attempt to combine a communicative action approach with with modelling of information and material flows.

Action Diagrams and Action Workflow maps should perhaps not be seen as rival notations, but as complementary and combinative methods. The author knows of one organization (The municipality of Linköping) which uses these two approaches together in a constructive way. The Action Diagrams are used to get detailed descriptions and the Action Workflow maps are used for an overall process description.

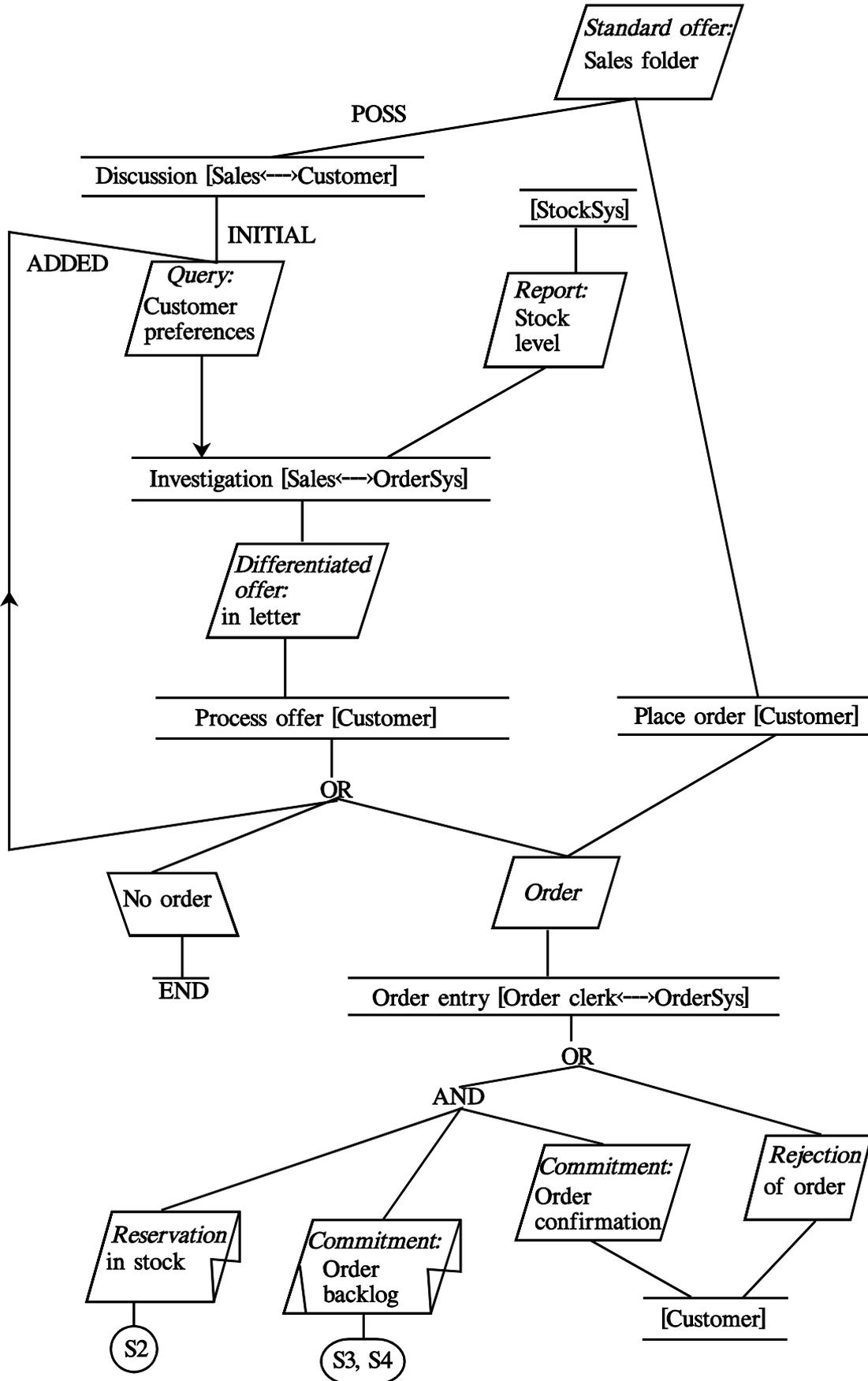


Figure 4.2 Action Diagram (S1)

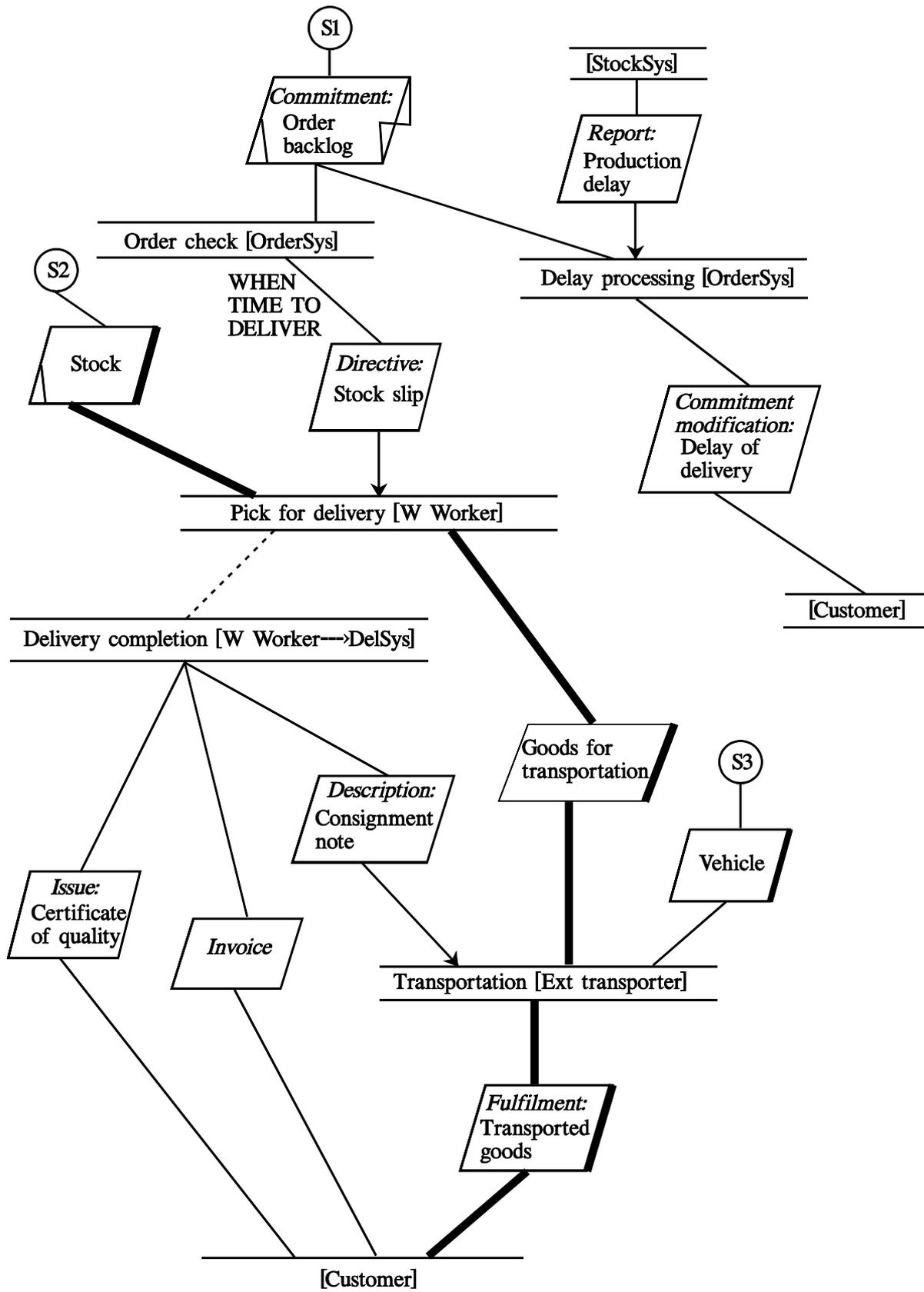


Figure 4.3 Action Diagram (S4)

### 4.3 A brief comparison

## 5 Conclusions

As stated in the introduction (section 1) there is a confusion concerning how to delimit business processes. Communicative/business action frameworks can give criteria for the delimitation of processes. Through the division into different generic phases of business processes it is possible to find clear points for starting and ending a specific business process.

Action Workflow is an important approach in this area. In this paper I have formulated an alternative generic framework called Business as Action game. This alternative framework is an attempt to gain a more symmetric role description of supplier and customer. There are mutual proposals, commitments, fulfilments of commitments and satisfaction to consider.

There is a lack of communicative action perspective in many approaches to Business Process Reengineering and process modelling. Action Workflow is an exception. In this paper I have discussed how an existing modelling method (Action Diagrams/SIMM) can be expanded with explicit communicative action concepts and hence be used within such an analysis framework. One important difference between Action Workflow maps and Action Diagrams is the relationships to underlying theoretical framework. In Action Workflow there is a direct correspondence between the generic level and the modelled workflow maps. Such a direct relationship does not exist between the Business as Action game Theory and Action Diagrams.

## Acknowledgements

This research has been financially supported by Swedish Council for Work Life Research and The Swedish National Board for Industrial and Technical Development. I would like to thank the following research colleagues for creative collaboration which has inspired me when writing this paper: Owen Eriksson, Mikael Lind, Lena Lindeberg, Marie-Therese Lundmark and Annie Röstlinger.

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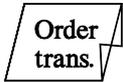
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## APENDIX: Notational rules for Action Diagrams



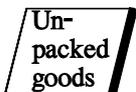
Information, messages; *action character in italics*



Closed information; information in a form not directly interpretable by humans



Human knowledge



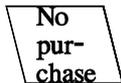
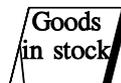
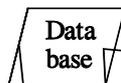
Material objects, possibly together with information



Person(s)



Store; action objects which is stored and sometimes changed over time



Non object/omission object; action object which is a result by an omission act

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Reorder [Purchaser] \*HQ

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Activity/action, performed by a performer at a place



Information relationship; is used together with symbols for information, closed information and knowledge



Physical relationship; is used together with symbols for material objects and persons



Sequence; a pure sequence between activities; relation of time and no material or information flow between activities

APENDIX: Notational rules for Action Diagrams (cont.)

