

Towards an integral understanding of organisations and information systems: Convergence of three theories

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Abstract

A need for an integrated theoretical understanding of organisations and information system is acknowledged. For this purpose three theories inspired by language action perspective are investigated. These three theories (Theory of Practice, Business Action Theory, Information Systems Actability Theory) are dealing with different but related subject matters. These theories have theoretical affinities but they lack clear relations. The common theoretical thread of these theories is articulated in terms of socio-instrumental pragmatism. These different theories give substance and basis for steps towards development of an integral understanding of organisations and information systems. This includes clarification, modification and convergence of the investigated theories.

1 Introduction

There is a wide-spread claim that computer-based information systems (IS) should be viewed and understood contextually. Information systems are parts of larger organisational work systems and the use of IS should give support to those broader work systems. But there is often reported that IS do not fit the organisational context which it is a part of. Many approaches have been developed intended to overcome these deficiencies. One can e.g. regard much of process management and knowledge management approaches as attempts to bridge the gap between IS and the organisational context. The early process management approaches (e.g. Davenport, 1993) claimed the need for a joint development of IS and human resources. Similar claims can also be found in many approaches to knowledge management (e.g. Nonaka & Takeuchi, 1995).

One main problem is that there seem to be noticeable differences between theories concerned with IS on the one hand and theories concerned with organisational issues on the other. Theories on IS can be oriented towards technological and informational aspects. Theories concerned with organisations are often oriented towards economic aspects including ways of allocating organisational tasks between people (issues of leadership, control, work structures etc). These different theories deal with different subject matters and their theoretical grounds are disparate and are thus hard to relate and combine. Continuing our argumentation we claim that there is a need for theories encompassing both IS and organisational aspects.

Attempts have been made to create IS theories which are more context sensitive, with ambitions to cover aspects of both IS and organisation. There are also theories concerning work and organisation which have been brought into the IS area. Examples of this are Activity Theory (Nardi, 1996; Kuutti, 1996) and Actor Network Theory (Walsham, 1997). The IS character seems, however, not yet to have been sufficiently described in these theories. There are also examples of non IS scholars trying to treat the relations between IS and organisational issues. The comprehensive work by Castells (1996) can be mentioned here. Although very illuminating, such theorising does not give sufficient in-depth and integral understanding of IS and organisation and their complex relations either.

Where shall we search for an answer to this quest for an integral understanding of organisations and information systems? We turn our interest to another set of theories brought in from outside the IS area: Theories oriented towards communicative action. Inspired by language action (LA) theories (Austin, 1962; Searle, 1969; Habermas, 1984) there are several authors who have described the character of IS: E.g. Goldkuhl & Lyytinen (1982), Winograd & Flores (1986), Holm (1996), Schoop (1999) and Goldkuhl & Ågerfalk (2002). The communicative action approach has also been used to describe organisations. E.g. Taylor & Van Every (2000) claim that communication is the very core of organisations. Organisations are constituted and sustained through communicative acts; confer also Boden (1994). Communicative action theories seem thus appropriate and promising to use as a common theoretical thread for understanding both IS and organisation.

We turn our interest to a particular group of three theories developed with inspiration from communicative action theory. 1) Business Action Theory (BAT) is a theory concerned with the business interaction between customer and supplier (e.g. Goldkuhl, 1998). BAT describes six generic phases of business interaction and it acknowledges communicative actions as well as value exchange between the business parties. 2) Theory of Practice (ToP) is a theory concerned with workpractices (e.g. Goldkuhl & Röstlinger, 1999). It gives a relational and contextualised description of an organisation or some part of it. It emphasises different "governance forces" of a workpractice, i.e. external assignments (from customers) and internal assignments (from management), external and internal norms and also instruments used in the workpractice (material as well as immaterial). 3) Information Systems Actability Theory (ISAT) is viewing IS as action systems (e.g. Ågerfalk, 1999). The theory conceptualises different use situations: Interactive, automatic and consequential use situations. The communicative character of IS is emphasised with recognition of both performative and propositional/conceptual aspects.

The last of these theories are thus oriented towards IS. The other two theories are oriented towards workpractice and business interaction, thus oriented towards more organisational issues. These different theories have a common theoretical background, not only in communicative action theory, but also in more general action theory. These three theories together can potentially give an integral understanding of different IS and organisational aspects. At the moment these three theories are not related to each other explicitly and they can thus not yet give a desired encompassing view of IS and its organisational context.

Thus we claim that the three theories together provide a potential for an integrated theoretical understanding of organisations and information systems. The purpose of this paper is to investigate these three theories and to make explicit connections between them. The purpose is thus to take steps towards theory clarification and integration.

A background in communicative action theory is one important theme connecting the three theories. The ambition, to go beyond communicative action theory and incorporating aspects of material actions and artefacts, is another binding force. Many actions in organisations are not communicative actions per se. There are many actions dealing with transforming and transporting material things. A comprehensive IS/organisational theory must incorporate such material aspects. To have a theory on computer-based information systems which does not acknowledge the technical and material character of computers seems to be a self-contradiction.

These three theories offer a possibility to view information systems as *organisational sign artefacts with action capabilities* (Goldkuhl et al, 2001). This stance transcends a pure representational view on signs. The representational aspect of signs is acknowledged, but the action character of signs is emphasised (e.g. Austin, 1962). Using the semiotic ladder of Stamper (2001) as positioning instrument, we will focus on pragmatic and social aspects of signs and communication.

There can of course be other candidates for theory integration. But in this paper we will not try to incorporate such other theories¹. What we will do however is to investigate and clarify the common theoretical thread of the three theories. One important reason for delimiting us to these theories, at this moment, is the closeness and affinity between them. They can be seen as members of the same theory family but concerned with different domains. It is an important task to make this theory family more congruent. But it should not be seen as an interest restricted only to the proponents of these theories. The theory clarification and integration have ambitions to take steps towards a coherent view on information systems and organisations.

The common theoretical thread of the three theories will be articulated in this paper. Through such articulation further theory integration can be facilitated. We call this common theoretical background *socio-instrumental pragmatism*. Pragmatism means an emphasis on actions. We are not creating a theory of isolated human actions. Instead the main interest is on actions directed towards other persons, i.e. social actions. We will in our action view also acknowledge the importance of using material or immaterial instruments when performing actions. We are thus interested in socio-instrumental actions.

2 Three action oriented theories

2.1 Theory of Practice (ToP)

ToP is a theory concerned with workpractices. The kernel of the theory is a generic characterisation of workpractices made in a contextual and relational fashion. The model is built from the following four basic categories:

- actors in roles
- actions
- action objects
- relationships between actors/roles

The focus is on a workpractice and how it satisfies its clients through the production of products based on different prerequisites. A workpractice can be seen as a whole organisation or some delimited part of an organisation or an integral part of (the interaction of) several organisations or some other meaningful unit of activities. ToP as theory and model was presented in Goldkuhl & Röstlinger (1999) and later refined in Goldkuhl et al (2001). It is a theory developed with inspiration from language action theories; e.g. Searle (1969) and Habermas (1984). It has, however, a broader scope and other sources for inspiration as is described in Goldkuhl & Röstlinger (1999) and Goldkuhl et al (2001). The generic model of a workpractice is depicted in figure 2.1.

¹ This paper should not be interpreted as a rejection of other theories and approaches. We have a great interest in different theories within an action perspective that give contributions to the understanding of IS and organisations. It is a task for future research to perform further theory integration. It should however be noted that all the selected theories are eclectic frameworks built from different action oriented theories.

The main result from a workpractice is products for clients¹. There exist several different prerequisites for creating products. An assignment can be either an externally furnished product order or an internally created assignment such as e.g. a job description. Base is “raw material” used for transformation into products. The need for economic compensation is also recognised in the model. Different norms and judgements have an impact on what is performed in a workpractice. Such norms and judgements are both externally furnished and internally created. The ability of a workpractice is also recognised in the model. Such kind of workpractice ability is seen as instruments for action and it consists of knowledge, artefact functionality and supporting descriptions as e.g. manuals. Knowledge and external instruments are always evolving over time through experiences from performed actions.

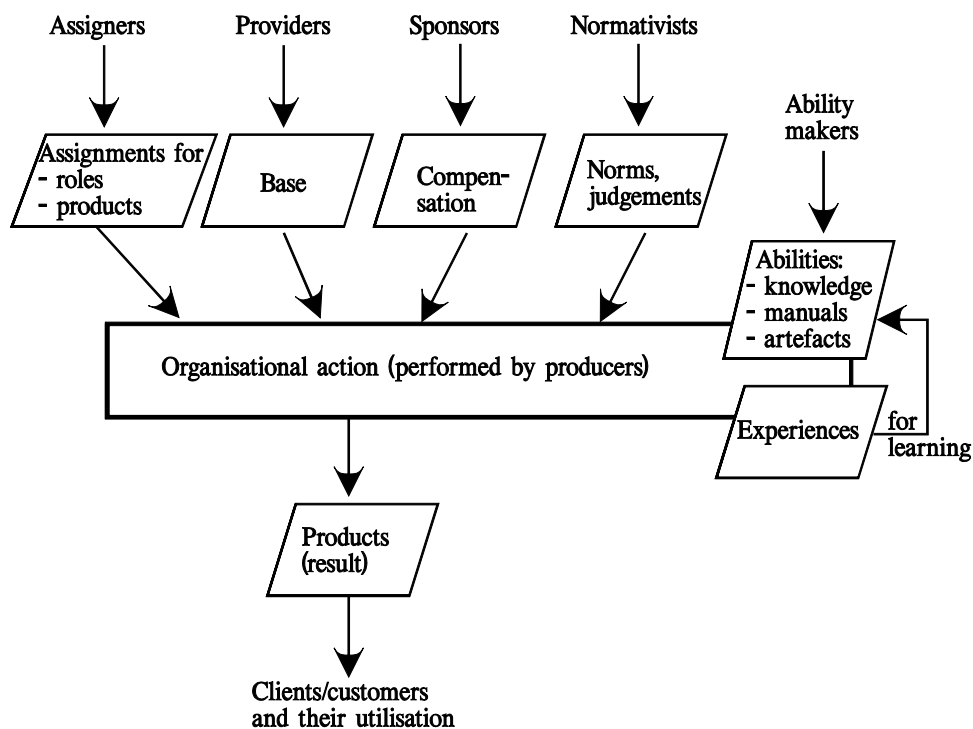


Figure 2.1 A generic model of workpractices – ToP model (from Goldkuhl et al, 2001)

The ToP model is claimed to be used as a basis for both further theoretical development and in practical development and evaluation situations. In the latter cases the ToP model has been used as a template for making ”workpractice definitions” of an organisation or parts thereof. In Goldkuhl & Röstlinger (1999) and Goldkuhl et al (2001) examples of applications are presented (from a web shop and municipal home care respectively). A ToP based workpractice definition is said to be an instrument for governing and focusing business and IT design (ibid). ToP aims at being a theory on a generic level. It is said to be used as basis for development of theories with more restricted domains. One example is Nilsson (2000) who has, based on ToP, developed an adapted theoretical model of knowledge management activities within organisations.

¹ The term “client” is used as it is a more neutral term than “customer”.

A workpractice is defined in the following way: "A workpractice means that some actor(s) - based on assignments from some actor(s) - makes something in favour of some actor(s), and sometimes against some actor(s), and this acting is based on material, immaterial and financial conditions and a workpractice ability which is established and can continuously be changed." (based on Goldkuhl et al, 2001).

2.2 Business Action Theory (BAT)

BAT is a theory on business interaction between customers and suppliers. It describes in a generic way how customers and suppliers interact when making business (the business logic). The business interaction is structured in six generic phases. These phases are:

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

BAT was presented in Goldkuhl (1998) and proposals for revisions and additions have later been presented in e.g. Axelsson et al (2000) and Goldkuhl & Melin (2001). The original phase model is depicted in figure 2.2.

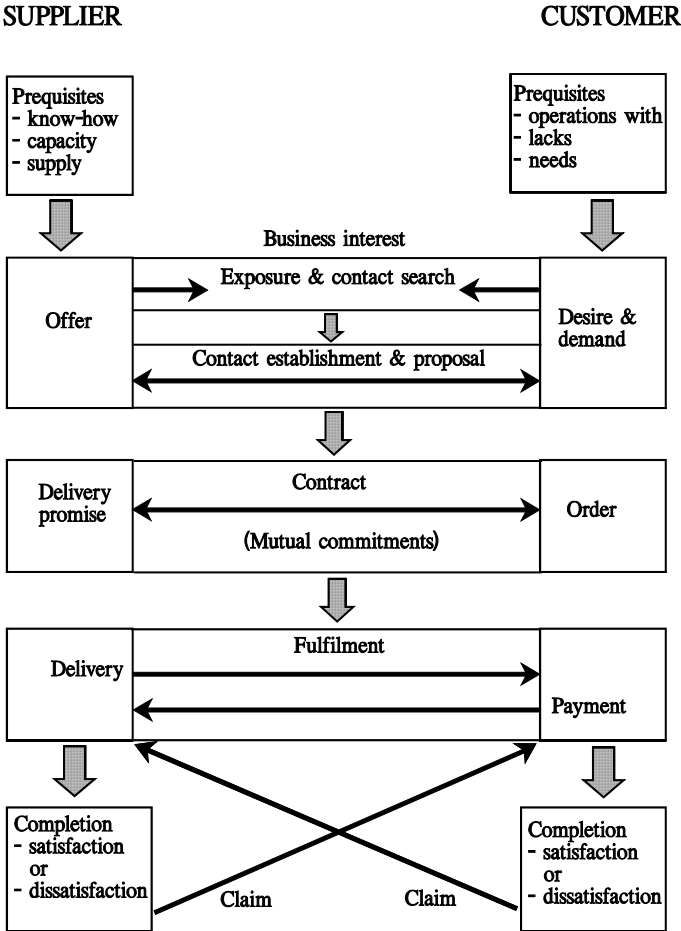


Figure 2.2 The BAT model of business interaction (from Goldkuhl, 1998)

Business interaction is considered to consist of business communication and exchange of value (products vs. money). The whole model is inspired by language action theories (e.g. Searle, 1969; Habermas, 1984). Inspiration comes also from other LA based business interaction models like e.g. Action Workflow (Medina-Mora et al, 1992), where different generic communicative acts are identified and ordered in a generic way. The BAT model differs from other LA models (as Action Workflow). It starts earlier in the business process and it also includes material acts (exchange of value). Generic communicative acts - like offer, delivery promise and claim (of supplier) and query, order and claim (of customer) - are identified and ordered in the phase model. BAT emphasises exchange between supplier and customer on each stage. The contract, as a mutual commitment made by both business parties, plays a central role in the business interaction. The phases before contracting can be seen as preparatory phases and after the contract has been established follows fulfilment and assessment.

Later development of BAT includes separation between recurrent business transactions and long term (frame) contracting (Axelsson et al, 2000) and introducing influences concerning corporate abilities (Goldkuhl & Melin, 2001). Lind & Goldkuhl (2001) has presented an architecture of generic layers as a conceptual development of BAT. The BAT model has been used as an instrument for design and evaluation of business processes (examples are found in the papers referred to above).

2.3 Information Systems Actability Theory (ISAT)

What we here choose to call ISAT is a theory on information systems. The theory is based on a particular perspective "information systems actability". ISAT has been presented in many different publications, e.g. Ågerfalk (1999), Cronholm et al (1999), Ågerfalk et al (1999) and Goldkuhl & Ågerfalk (2002). The theory has been used as a basis for developing methods for information requirements analysis (Ågerfalk, 1999). It has also been used as an instrument for understanding and evaluating information systems. The actability notion is central in the theory. Actability is defined in the following way: "An information system's ability to perform actions, and to permit, promote and facilitate the performance of actions by users, both through the system and based on information from the system, in some business context" (Cronholm et al, 1999). A computerised information system considered to be an "action system". It is both an instrument for performance of action and a support tool for humans to perform their actions. The theory distinguishes between three types of IS usage situations:

- Interactive usage situation (where users performs actions interactively together with and through the system)
- Automatic usage situations (where the system performs actions by itself based on predefined rules)
- Consequential usage situations (where users performs actions based on information from the system)

An IS is interpreted to consist of:

- An action potential (a predefined and regulated repertoire of actions)
- Actions performed through and by the system
- An action memory (a memory of earlier performed actions including prerequisites for actions)
- Messages and documents (where some documents are action media for user's interactive actions)

An information system as an action system, according to ISAT, is depicted in figure 2.3. Different kinds of actions (and thus usage situations) can be comprehended from this figure.

Actability can be compared to the usability notion, which is one key concept within human-computer interaction (e.g. Nielsen, 1993). ISAT gets some inspiration from the usability area, but it tries also to extend and transcend this view on IS (e.g. Cronholm et al, 1999). Parts of this broadening of views are the emphasis on actions performed by both users and IS. An IS is seen as an organisational action artefact (Goldkuhl & Ågerfalk, 2002). ISAT does not only focus on interactive situations, but also on automatic and consequential situations as described above.

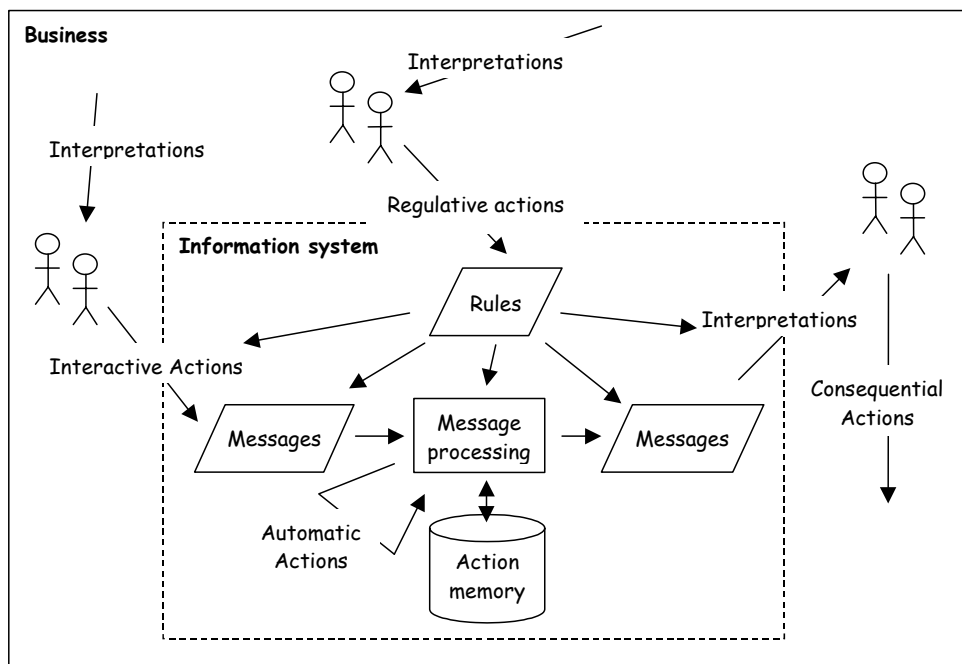


Figure 2.3 Information system as action (from Ågerfalk, 1999)

The action view on interaction between human user and the computerised IS has led to a generic model of three phases: The Elementary InterAction Loop model – EIAL (Ågerfalk, 1999). This model is depicted in figure 2.4.

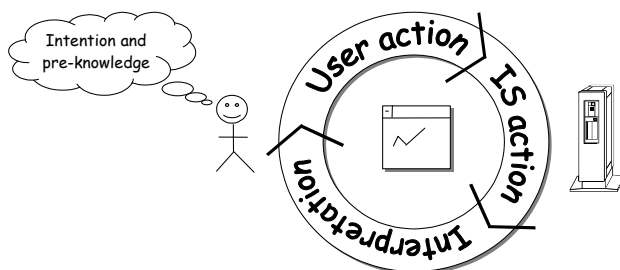


Figure 2.4 The Elementary InterAction Loop – EIAL (from Ågerfalk et al, 1999)

3 Towards a theory integration

3.1 Action translation between theories

The three theories are concerned with partially different subject matters. They are however also covering similar kinds of phenomena. The theories are partially using different concepts (terminology), which makes it somewhat problematic to compare them and to use them together. In our analysis of the theories we have found it necessary to make them more comparable with each other. For that reason we have applied a common example. The example (a web shop) is described by different organisational actions performed by different actors. We have used the three theories to look at these actions. This means that we have used the concepts from each theory to classify each action situation. In this sense we made an "action translation" between the theories. We have created an example which covers phenomena valid for all three theories. The use of the simple example is made to illustrate the three theories and relations between them.

We here describe the example briefly: An enterprise (here called eCompany) is selling products through the Web. Their web site consists of product descriptions (standard offers) and purchase functions. Customers can register their order through a form at the web site. After receiving orders the IT system¹ of eCompany produce delivery directives. The IT system handles information about customer orders and products in inventory. The delivery directives are used by stock workers, when they pick products from the inventory and deliver to the customers. For further usage of this example we have delimited four action situations:

- 1) Customer searching among available products at the web site
- 2) Customer registering an order through the web site
- 3) IT system handling of orders and producing of delivery directives
- 4) Stock workers picking products from inventory and delivering to customers

We have made a classification of different aspects of the four action situations according to the three theories. This classification is documented in figure 3.1 below.

For BAT the different actions have been classified according to the *generic phases*. Three phases of BAT have been identified; proposal, contract and fulfilment phases. The different actions have been categorised as examples of *generic actions and actors* of business interaction; e.g. supplier offer and customer order.

The ToP analysis has been focused on different *roles* and *action objects*. E.g. the IT system is seen as an instrument for transforming product orders, and the stock workers are identified as producers. We want to comment on the distinction between external and internal assignments. The customer order (as product order) is an externally generated assignment. The product description (as the product repertoire of eCompany) is an internally generated assignment, although it is of course exposed to potential product orderers (customers).

The different action situations of the example have been classified as different *IS usage situations* according to IS Actability Theory; i.e. interactive, automatic and consequential actions. Different actor roles (customers and stock workers) are identified as *IS users*. We have also identified different types of *information actions* performed by IT systems or users; e.g. exposing, searching, receiving, updating action memory, communicating.

¹ In the following we use the term IT system (and not information system) in order to emphasise our designation to systems based on information technology.

eCompany Example (Performed actions)	Business Action Theory (BAT)	Theory of practice (ToP)	IS actability theory (ISAT)
1) Customer searching among available products at the web site	Proposal phase; Product description on the web = supplier making offers to customers	Product description on the web = product repertoire (internal assignment); Web site = instrument for product orderers	Interactive action; Exposure and search of possible offers from eCompany/web site to customer/user
2) Customer registering an order through the web site	Contract phase; Customer sending order to supplier	Customer order = product order (external assignment); Web site = instrument for product ordering	Interactive action; Customer/user registering order; eCompany/web site receiving order
3) IT system handling of orders and producing of delivery directives	Fulfilment phase; Supplier preparation for delivery of products	IT system = instrument for transforming product orders (assignments)	Automatic action; Producing (communicating) delivery directives through updating action memory concerning orders and inventory
4) Stock workers picking products from inventory and delivering to customers	Fulfilment phase; Delivery of products to customer	Stock workers = producers; Inventory = base; Delivery from eCompany = products for clients and their uses	Consequential action; Stock workers/users picking and delivering products based on IT produced delivery directive

Figure 3.1 Illustrations of different aspects of the BAT, ToP and ISAT theories through a common example (eCompany)

In sections 3.2-3.5 below we will perform an analysis of differences, similarities and overlap between the three theories.

3.2 Relations between ToP and BAT

We will here focus on some relations between Theory of Practice and Business Action Theory. BAT is a two role model with focus on business interaction between two business partners (customer and supplier). ToP can be seen as a model of the workpractice of a producer (supplier), with relations not only to its clients (customers) but also to many other parties (especially those who creates prerequisites for the workpractice). BAT is a reciprocal model and ToP is oriented towards one workpractice and how it satisfies its clients. One fundamental difference is that BAT describes business interaction in terms of commercial relations, when ToP tries to describe both commercial practices and non-commercial practices, i.e. it has a broader scope even in this sense. This is one explanation why the terminology differs. ToP has tried to use a more "neutral" terminology, while BAT has a clear business terminology. We had above (in the example and the reasoning around it) a clear business focus and we will continue with such a main focus below.

Both theories have an action and actor orientation. BAT runs on the organisational level. Supplier and customer organisations are seen as actors. There is no explicit connection to human actors. In ToP both organisations and humans are conceived as actors.

BAT describes the interaction between a supplier and a customer in some more detail than ToP, but there are also clear correspondences between the theories. The customer order (in BAT) is described as one kind of assignment (product order) in ToP. The delivery from the supplier (in BAT) is described as the main result from the workpractice - the product (in ToP). Payment from the customer (in BAT) is one type of compensation (in ToP). These are the three parts where there is a clear correspondence between BAT and ToP. One can also say that parts of claims from customer (in BAT) can be interpreted as judgements (in ToP). Other actions described in BAT, as e.g. supplier's offer, delivery promise and possible claims are disregarded in ToP.

There are many aspects in ToP which are disregarded in BAT. Examples of such important missing parts are internal assignments and bases from providers. In BAT the first phase are concerned with establishing prerequisites for making business. For the supplier this is said to be know-how, capacity and a supply. Parts of these business prerequisites can be compared with the workpractice ability of ToP. We think that this is one point where the two theories could converge and not use different concepts and terms. A proposal is that BAT uses the concept of organisational ability, since this concept is more theoretically articulated (Goldkuhl et al, 2001; Goldkuhl & Braf, 2002).

One way to conceive BAT in relation to ToP is to say that BAT is a magnification of some aspects in ToP. The latter is a more holistic and encompassing theory covering both inter-organisational and intra-organisational issues, while BAT has an inter-organisational focus. BAT can be seen to focus on how product orders are created and resolved. BAT describes how customers (product orderers/clients in ToP) and suppliers (producers in ToP) establish agreements and how these agreements are fulfilled and possibly questioned through claims. BAT can in this sense be seen as a business assignment theory and as such an extension of ToP in a similar way as the product theory of Goldkuhl & Röstlinger (2000) is considered as an extension and magnification of product aspects of ToP. One further development of BAT could thus be to more clearly adapt it to ToP as a supporting sub-theory.

Is there no need for influence on ToP from BAT then? We do think that there is something to be learned from BAT. There is in ToP only one thing that is thematised in the relation from producer/supplier to client/customer: The product as a result of the workpractice. Of course the product should be seen as the main result, but there are other aspects which could also be seen as important. There is not only needs for products; there is also a need for product descriptions. We propose to add product description as one result of the workpractice in the ToP model. E.g. product descriptions are important supplements to products for an effective utilisation of them (often in the form of manuals). Following BAT, different communications from supplier to customer must include description of the product. An offer must of course, to some extent, describe the product which is offered.

3.3 Relations between ToP and ISAT

We will here focus on some relations between Theory of Practice and Information Systems Actability Theory. One important part in ToP is its emphasis on the abilities of the workpractice as important prerequisites. The ISAT view on information systems is that such

systems holds and exposes an action repertoire. The IS has powers to act (in automatic way) and it also affords possibilities for users to interactively perform actions through the system. These different ingredients of the IS action repertoire are to be conceived as its actable ability. Such an ability is part of the total ability of the workpractice which is clearly acknowledged in ToP. The details of IS actability are, however, not described in ToP. These two theories seem to be congruent concerning organisational ability. ToP gives the broad view and ISAT presents a deepened view concerning IT abilities.

IT systems are seen as instruments in ToP. This means instruments for the producers in their performance of actions in order to create products for clients. In ISAT this instrumental view is acknowledged when such systems are viewed as supporting devices for human action (in interactive and consequential actions). But in ISAT IT systems (as artefacts) are also viewed as possibly independent performers of actions (in the automatic mode). This aspect is not explicitly recognised in the ToP model. We propose that ToP should adopt the differentiated view of IT artefacts as it is expressed in ISAT.

One of the strengths of ToP is that it gives a clear view of relations to different external actors (e.g. clients, providers, sponsors). The roles in ISAT are restricted to users of IT systems or other IT stakeholders. Other specific roles are not recognised. Concerning these matters we conceive ToP as a necessary complement to ISAT. When discussing IT systems in workpractices¹ we think that a more nuanced role apprehension is often needed than the one offered by ISAT. We think that ToP has an interesting potential for how to view and pursue the development of IS and thus a potential for ISAT on a theoretical level. The different categories of a workpractice, as they are described in the ToP model, must be treated cognitively in the workpractice, and thus possibly by support of IT systems. An IT system can hold and treat information about the different parts of a workpractice (e.g. its assignments, products, clients, norms)². These categories could thus influence a proper theory of IS or at least complement it when applied in design and evaluation situations. At the moment ISAT does not consist of such workpractice categories.

On the other hand we think that ISAT has - with its notion of actability - an interesting potential for ToP. In ISAT, actability is seen as an ability to perform and to support action. The domain of ISAT is IT system usage. This means that the notion of actability is here restricted to such action. But this need not to be the case. Why cannot actability be valid for other types of actions? ToP is concerned with actions in and related to a workpractice. Producers perform actions in the workpractice in order to create products for clients. There ought to be favourable conditions for the producers to perform their actions. The ToP model describes different workpractice prerequisites. In ISAT only one of these (the functionality of IT artefacts) are emphasised to be actable. All other prerequisites should also have actable features as we see it. Other parts of the workpractice ability as knowledge and competence of producers and different documented instructions should also be actable. Actable knowledge is knowledge that guides the actor when performing actions and thus facilitates good quality in results³. Base is an important prerequisite for the workpractice. The base ("raw material") must be actable in the sense that it is easy transformable into products with the aid of suitable (i.e. actable) instruments. Assignments can also be characterised as more or less actable. An assignment that is actable informs the producers in a good way, so they can accomplish what is expected. Diffuse assignment, which leaves producers with uncertainty, do not have the

¹ We here think of different application situations as e.g. planning, design and evaluation of IT systems.

² In Goldkuhl et al (2001) this potential application of ToP is described in more detail.

³ This view is fully in line with Dewey (1938) and other proponents of american pragmatism.

same actability. Producers have difficulties to act properly when trying to follow vague assignments.

This reasoning is based on our view and definition of actability. We conceive actability to be a property of something which *enables* and/or *contributes* to the performance of actions. Actable objects can be both *external objects* (as e.g. artefacts or documents) or *internal states* (e.g. an actor's knowledge about something). We designate that actability does not only include *executable* properties which enables the action to be performed but also *informative* properties, which guides the actor in his choice, performance and assessment of actions¹. Such informative properties can apply to questions concerning what to do, why doing or why not doing, how to perform, when to perform and where to perform and how to assess the outcome.

3.4 Relations between BAT and ISAT

We will here focus on some relations between Business Action Theory and Information Systems Actability Theory. As described above, BAT contains no references to artefacts. IT systems or other artefacts are not mentioned as categories in BAT. This means that if one describes business processes which includes IT systems, there is no conceptual support from BAT for artefact descriptions. On the other hand, ISAT gives a detailed description of different IT artefact functions.

The view on actors/performers are different in the two theories. In a business-to-business context, BAT is restricted in its actor view to "organisations as actors". The supplier and the customer (as organisations) are viewed as the main actors which also involves an inter-organisational perspective. In ISAT the main actors/performers are the IT systems and their human users. This means that BAT has a focus on the organisational level and there is no differentiation between different performers (humans or artefacts) in the organisation. ISAT has more of an intra-organisational focus, recognising different performers (as IT systems or human users) and their actions. There is at least no explicit focus on inter-organisational issues in ISAT. One consequence of this implicit intra-organisational focus is that the relations to external actors (customers/suppliers) are weak in ISAT. BAT has, as been mentioned above, a focus on commercial practices. In ISAT there is no such delimitation. ISAT can be applied to both commercial practices and non-commercial practices.

One consequence of these differences between the theories is that there is a *categorical distance* between the theories which makes it hard to relate the theories. However, the two theories have a common background in communicative action framework. They focus on different aspects of communicative actions; in BAT communicative acts are also seen as business acts and in ISAT communicative acts are also seen as IT mediated acts. Both theories keep a close link to its communicative action origin². We think that the theories should become more close to each other. BAT should recognise intra-organisational issues. Human actors and artefacts and their different roles and functions should be acknowledged. ISAT should recognise the inter-organisational business context more explicitly.

In section 3.3 (ToP vs. ISAT) we discussed the potential of expanding the actability view to the workpractice domain. We think that this is also valid for BAT in a transferred sense. For a

¹ We are here inspired by Mead's (1938) view on actions with its perceptual, manipulatory and consummatory phases.

² This holds also for ToP.

supplier to perform its business acts towards a customer there must be different internal conditions. Such conditions (implicit in BAT, but explicit in ToP) should support the performance of the different acts. These conditions should thus be actable. The same reasoning applies to the customer. This is fully in line with the discussion above concerning ToP (sec 3.3). The discussion can be expanded to the interactional sphere between customer and supplier. What the supplier performs towards the customer should be actable for the customer. E.g. the offer and its product descriptions should be actable for the customer in the sense that he can judge what and how to perform. Should the customer purchase or refuse the offer? The customer's actions should also be actable for the supplier. The customer's product queries should be transformable into offers. This means that what is done by one business partner should be actable for the other one.

The business contract has a unique position as a joint action of both parties. It is an agreement made as a mutual commitment. The contract must be actable for both parties and their subsequent actions. We can call this reciprocal actability. This conclusion leads us further. A business action made by one actor should not only be actable for the other partner. Such an action should also be actable for the actor in later actions. An example, a business offer made by a supplier should be actable both for the customer (e.g. possible to make proper purchase evaluations) and for the supplier (e.g. possible to realise into products according to offered prices).

3.5 Comparing the three theories

We have in sections 3.2-3.4 above performed a comparison in pairs between the theories. In this section we will bring our comparison to the level of all three theories.

When comparing the three theories one can find some interesting patterns. In BAT there is a restriction to only two *roles*; customer and supplier. ISAT shows two kind of performers; IT system and IT system user¹. ToP has a greater richness in roles. In the first place there is a differentiation between roles concerned with 1) creating prerequisites, 2) producing results and 3) receiving results. Especially among the first group several subroles are distinguished; e.g. assigners, providers, sponsors, ability makers. Some of these roles are even sub-classified; e.g. different types of assigners are identified.

There is a difference between the theories in how to regard *artefacts*. In BAT there is no recognition of artefacts at all. When reading the BAT columns in figure 3.1 there is no reference to IT systems or other artefacts. This can be contrasted to ISAT where there is a great focus on IT artefacts and different properties of such artefacts. In ToP artefacts are recognised as one type of instrument. Both IT and other types of instruments/artefacts can be identified. ToP does not contain the fine sub-categories of IT artefacts as ISAT.

BAT is a model with focus on the *dynamics* of business interaction. It describes different phases, which are sequentially ordered from a start to an end. ISAT contains also some dynamics. Three types of usage situations are identified and related. The relations between these situations are not as strictly ordered as in BAT. The interactive usage situation is, however, ordered in three generic phases with a strict order (the Elementary InterAction Loop - EIAL). This interaction loop has a clear circular (recurrent) character in contrast to the BAT model, which lacks such a dynamic feature. The ToP model is not oriented to dynamics. It

¹ Ågerfalk (2001) has made a sub-classification of different IT users; but we are not treating this classification here.

expresses principal relations between different actor roles and it is in that sense abstracted from such dynamics (as sequences of actions) which are expressed in BAT.

A general comment concerning the comparison of the three theories is that it is obvious that they are concerned with different subject matters. BAT has details concerning business logic, which is not covered by the other two theories. ToP has details concerning workpractice logic which is not covered by the other two theories. ISAT has details concerning IT usage which is not covered by the other two theories. But there are also similarities between the theories. It is interesting to see that they all, in principal, cover the described types of action. Action characters of the four situations are described with the support of the theories, although in different ways and with different emphasis. The three theories give complementary action views of such organisational situations. They all acknowledge communicative actions. However different aspects of such acts are emphasised from an organisational perspective. In ToP, communicative acts are conceived as acts of a workpractice (work acts). In BAT, the central concept is business act with recognition of both communicative and material business acts. In ISAT, IT mediated acts are considered as communicative acts.

When performing the analysis and comparison we have found *similarities* and *dissimilarities* between the theories. The relations between ToP, BAT and ISAT have been clarified. We have been able to compare the three theories according to some *common categories* which have emerged through our work. The analysis has proved that our initial assumption about theoretical affinity was correct. The analysis has made the different aspects of the common theoretical ground more explicit. The different theories can be seen as complementary, compatible and coherent. Some unnecessary (conceptual and terminological) differences have been identified. We have formulated some proposals for modification and integration in order to increase the theoretical cohesion. These proposed changes include mutual adaptations in order to arrive at a theoretical convergence.

In figure 3.2 we have summarised our comparison from this section and the sections above (3.2-3.4). When doing this we have also made the categories for comparison explicit.

We here summarise the proposed changes of the three theories:

- BAT should use the concept of organisational ability (from ToP)
- BAT should recognise intra-organisational issues; human actors and artefacts and their different roles and functions should be acknowledged (from ToP and ISAT)
- ToP and BAT should adopt an actability perspective (broadening of the actability concept from ISAT)
- ToP should include product descriptions as one result of the workpractice (inspiration from BAT)
- ToP should adopt the differentiated view of IT artefacts as it is expressed in ISAT
- ISAT should inherit the more nuanced role apprehension from ToP
- ISAT should use workpractice categories (from ToP) as a conceptual basis when characterising IS
- ISAT should recognise the inter-organisational business context more explicitly (from BAT)

Categories	ToP	BAT	ISAT
Scope	Workpractice and its contextualisation	Business interaction	IT usage
Subject	Commercial and non-commercial practices	Commercial practices	Commercial and non-commercial practices
Business logic	Some principle actions are recognised	Main focus; detailed (especially concerning exchange)	No focus
Organisational focus	Inter-organisational and intra-organisational focus	Inter-organisational focus	Intra-organisational focus
Capabilities	Workpractice ability (encompassing view)	Know-how and capacity	Action repertoire of IT system
Dynamics	Abstracted from dynamics (principal relations)	Dynamic phase model (from start to end)	Dynamic phase model (circular)
Roles	Multi-role model (workpractice and related actors)	Two-role model (reciprocal model of business parties)	IT system, IT users and other IT stakeholders
Role character	Three types: <ul style="list-style-type: none"> • Creating prerequisites • Producing results • Receiving results (with sub-types) 	Two interactors in exchange situations: <ul style="list-style-type: none"> • Customer • Supplier 	Two types: <ul style="list-style-type: none"> • Humans • IT artefacts
Actor view	Recognising organisations and humans as actors	Organisations as actors (no focus on human actors)	Focus on human actors (as IT users)
Artefact/instrument recognition	Artefact as one type of instrument	No recognition	Detailed focus on IT artefact
IT artefact role	Instrument	No recognition	Instrument and performer
Emphasis of communicative acts	Work acts	Business acts	IT mediated acts

Figure 3.2 Comparison between the three theories

4 Socio-instrumental pragmatism

The three theories described above are all theoretically based in language action. Yet, they all include more than an LA orientation. In this section we reconstruct and articulate some of the common theoretical thread of the three theories. We call this common ground socio-instrumental pragmatism. Elements of this theory can also be found in some earlier publications (Goldkuhl, 2001; 2002; Goldkuhl et al, 2001; Goldkuhl & Ågerfalk, 2002).

The basic concept is action. We start with a classical view on action: A purposeful and meaningful behaviour of a human being. We acknowledge the intentionality of human action. A human intervenes in the world in order to create some difference. A human performs an act and thereby create some result. Often the intention does not lie in the result, but rather in possible subsequent effects of the action and its result. The distinction between an action result (which lies within the range of the actor) and action effects, which may arise as consequences outside the control of the actor, is important (von Wright, 1971). Action effects can be both intended and unintended. An action is always performed in a situation of time and space and with constraining and facilitating factors. An action is performed in the present based on a history and aiming for the future. See figure 4.1 for an illustration of human action.

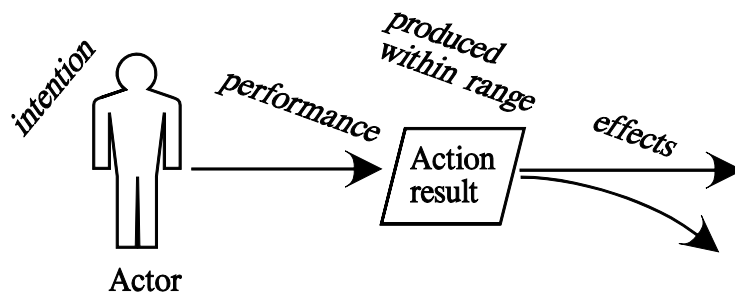


Figure 4.1 A model of human action

This classical action model is expanded into a model of social action. A social action is an action oriented towards other persons (Weber, 1978). It can be a communicative act; e.g. someone saying something to another person. The result of this act is an utterance. Effects of the act are the interpretation and understanding of the listener and his subsequent responses or other actions¹. The listener is a recipient of the action result. Through such a social action, relations between intervening actor and recipient are established (Habermas, 1984), which is also an effect the performed action. A communicative action, like a request, gives rise to certain expectations between the actors concerning future actions. A social action is, however, not restricted to communication. Even material actions count as social actions if they are directed towards other persons. A supplier delivering physical goods to customers is an example of a social and material action (Goldkuhl, 2001).

In the discussion above we have focused on intervening actions. These are actions aiming at changes in the external world. But there are other kind of actions which do not have such purposes. When a person reads a book or listens to some conversation, his purpose is to inform himself. He is not making an intervention in external world. The actor performs such perceptual acts in order to influence (change or sustain) his inner world. His interpretation is based on his prior knowledge including expectations towards the actual situation. We distinguish thus between two fundamental types of action: 1) intervening acts aiming at external change and 2) receiving acts aiming at internal change². If we look at communication between two persons, such a situation will consist of an intervening (communicative) act performed by the speaker and a receiving (interpreting) act performed by the listener. The speaker produces an utterance, which is a sign and the listener interprets this sign. A sign is something produced and something interpreted, and as such it is a link between two acts (one

¹ Besides the effects directly related to the intended listener, there might be other effects; e.g effects on other persons listening to the communication.

² These different acts correspond to the distinction of overt and covert actions (Schutz, 1962; Goldkuhl, 2002). Covert actions include however also the category of action-through-reflection (ibid).

communicative and one interpretative) in social interaction. In a typical communication the roles of speaker and listener shifts over time. A listener becomes a speaker when he responds to the initial speaker who then becomes a listener. Different intervening actions are related to each other in patterns of subsequent actions. An initiative gives rise to a response. Such a responsive action will also have the role of an initiative if it gives rise to further responses in the social interaction (Linell, 1998). A simple model of social action is depicted in figure 4.2.

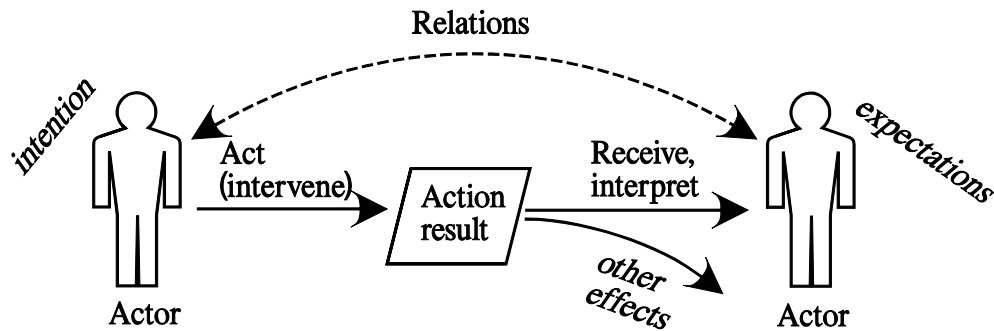


Figure 4.2 A model of social actions

For the performance of most actions, people need instruments of different kinds. When communicating, people need a common language as an instrument. For performing material actions one does often need external instruments. Such instruments extend the ability of an actor. For example when transporting and lifting heavy goods one needs certain (external) devices. For some actions, external instruments have the role of facilitating. Some other actions are even impossible to perform for a human without the aid of certain instruments, which in such cases have the role of enablers.

An external instrument is nearly always artificially made; i.e. an artefact. Artefacts can have different roles in relation to humans, and they can also be more or less advanced. We distinguish between three artefact roles¹ (and their corresponding types of action):

1. Static tool (artefact-supported human action)
2. Dynamic tool (human-artefact co-operative action)
3. Automaton (human-defined artefact action)

One example of the first artefact role is a human wielding an axe when chopping wood. A human manoeuvring a car is an example of the second artefact role. This involves an active use and surveillance by a human. A washing machine is an example of the third artefact role. A human initiates the machine which then works autonomously. This last category means that an instrument has got the ability to perform actions independent of humans. This independence is however not total. It is conditioned by the action repertoire of the artefact which has been constructed by humans. As said above it is also conditioned by human initiation and usually by human interruptance.

Instruments can thus be used for making material interventions. Instruments can be used to refine and move objects. A human, when performing material acts, works on material objects. Objects are transformed through actions. When baking, different ingredients (the raw material) are used as a *base* for production of the result; e.g. a cake. In transportation an object is moved from one place to another. The object at the original place is a base in this

¹ The borders between these three categories are not always distinct. These categories have been described earlier by Goldkuhl & Ågerfalk (2002).

transportation act, and the object at its destination is the result. In figure 4.3 we have refined the action model to a socio-instrumental action model. We have also included some other important action aspects to a more comprehensive model. All these aspects are not commented in our text here. We refer to earlier publications concerning this model (e.g. Goldkuhl, 2001; Goldkuhl & Ågerfalk, 2002).

For performance of many actions humans thus use external instruments. There are also many internal preconditions, which can be seen from fig 4.3. People must of course utilise their own knowledge for action. People must be knowledgeable in order to act. The world is perceived and conceived by conscious humans. Human abilities are however not only developed in fully conscious ways. Learning is often an evolving process, based on reflexive repercussion from intervening actions and effects (Giddens, 1984).

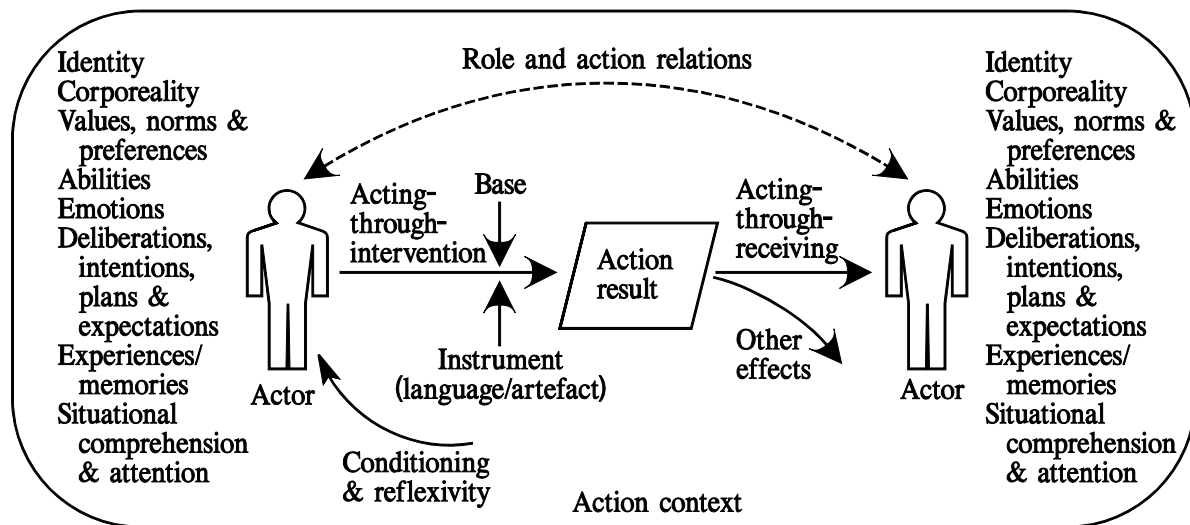


Figure 4.3 A model of socio-instrumental actions (modified from Goldkuhl & Ågerfalk, 2002)

Many actions are performed within organisations. Humans are acting in organisational roles. When a human (as an employee) is performing an action within an organisation, then he acts on behalf of that organisation (Ahrne, 1994; Taylor & Van Every, 2000). This means also that the organisation performs this action. A human performing an organisational action is always a dual action; at the same time performed both by a human and by the organisation. As said above actions can be performed by humans and artefacts. This means that even artefacts can perform organisational actions. In this view an organisation is considered to be an actor. It can however not act by itself. It must always act via its human and artificial agents.

In order to illustrate some aspects of SIP, we will use a simple example. The example was introduced in sec 3 above. We used it in that section to illustrate the three theories BAT, ToP and ISAT and relations between them. Now the time has come to use the same example to illustrate some aspects of socio-instrumental pragmatist theory. In figure 4.4 we characterise the four action situations (cf. sec 3.1 above) using some categories from SIP. These generic action categories have been used to describe the four different action situations in a comparable way. This example shows the applicability of these generic categories to reveal similarities and dissimilarities and between different action situations. The described aspects give a complementary view in relation to the views conveyed by the other three theories. The SIP view is fully congruent with the views of the other theories.

Action examples	<i>1) Customer searching among available products at the web site</i>	<i>2) Customer registering an order through the web site</i>	<i>3) IT system handling of orders and producing of delivery directives</i>	<i>4) Stock workers picking products from inventory and delivering to customers</i>
Action categories				
Performers	Customer + web site	Customer + web site	IT system	Stock worker
Main interventionist	Web site	Customer	IT system	Stock worker
Character of performers & performance	Co-operative human & artefact action	Co-operative human & artefact action	Artefact action	Human action with artefact support
Character of human action	Inquiring and interpretative action	Communicative action (order)	--	Material action (fulfilment of received order)
Character of artefact action	Guiding and showing (=communicative action; offer)	Guiding & receiving action	Updating & communicative action (directive)	(only support)
Type of artefact	Web-based IT artefact	Web-based IT artefact	IT artefact	Material handling equipment
Role of artefact	Dynamic tool	Dynamic tool	Automaton	Static & dynamic tools
Initiative for action	Customer's purchase need	Customer's discovery of attractive product offer	Registered order	Delivery directive
Base	Product descriptions at web site	Customer's specified purchase need	Registered order	Products in inventory
Other important action prerequisites	Web functionality at customer's place	Understanding of how to purchase through the web	Programmed action repertoire of IT system	Job description for stock workers
Main action result	Customer knowledge about purchase possibilities	Customer's web-registered order	Delivery directive	Delivered products
Action result character	Knowledge	Signs (electronic)	Signs (paper)	Material objects
Recipient of action result	Customer	Web site	Stock workers	Customer
Possible effects	Possibilities for customer to purchase products	Delivery of products to customer	Delivery of products to customer	Customer's utilisation of products

Figure 4.4 Illustration of different action categories (eCompany example)

One question is how to conceive SIP in relation to the three other theories (ToP, BAT, ISAT). Is it a fourth theory on the same level as the others? As a common theoretical thread we would not consider it so. We rather call SIP to be a *progenitive theory* for the other three theories. This means that ToP, BAT and ISAT are based on and incorporate theoretical constructs of SIP. The SIP theory, as a generic view of socio-instrumental actions, has a *generative power* for development of other more particularized theories; i.e. such theories have a narrower focus and more dedicated domain, as is the case for ToP, BAT and ISAT.

5 Towards an integral understanding of organisations and information systems

Our intention behind this paper is to give a contribution to an integrated understanding of organisations and information systems. This has been pursued mainly through investigating three theories concerned with workpractices, business interaction and information systems. This investigation has led us to an articulation of the common theoretical thread of these theories (socio-instrumental pragmatism). We will now *summarise* what has been achieved through formulating some important principles concerning organisations and information systems. What we present here is to be seen as *important selections* from these four theories. This is a way of *essentializing* what has been said above.

Organisations imply doing – people are performing actions aiming at results and effects. People act in order to make differences in the external world. Humans intervene through communication and through material changes. They use instruments (language, artefacts) for enabling or improving their actions. In order to perform knowledgeable interventions, people must establish an adequate knowing of the world, which is made through covert actions of interpretation and reflection.

Action is thus a central concept and this implies actors. Humans are actors, but not the only kind of actor. Organisations are conceived to be actors. Organisations cannot however act by themselves. They must act through their agents. Employees of an organisation are agents of that organisation. These human agents are acting on behalf of the organisation. Humans are however not the only agents. Different artefacts, as e.g. IT systems, can be given roles as agents performing organisational actions. This gives rise to some fundamental questions concerning organisations, humans and IT systems:

- How does an organisation become and remain an actor?
- How does a human become and remain an agent for an organisation?
- How does an IT artefact become and remain an agent for an organisation?

It is possible to give one short answer to all these questions: *This is done through communication, but not only*. This answer will be elaborated below. We will try to elaborate on “how to become” and “how to remain”.

Organisations are constituted and established through communication. Without constituting acts (of communicative character) made by the principals behind the organisation and different legal authorities, the organisation cannot exist (Searle, 1995; Taylor & Van Every, 2000). An organisation exists as an agreement (a communicative fact) between the principals and other parts of the society. Through such constitutive actions, an organisation is given a formal authority to act. Hence, communication does play a decisive role when an organisation becomes an organisation and an actor. But communication is not enough. Financial and

material resources must also be furnished. Otherwise, an organisation will have no capacity to act.

Organisations exist through recurrent patterns of actions. Such patterns (institutions) must be continuously reproduced through actions performed by different organisational agents (ibid and Boden, 1994). Many organisational communicative actions are performed by IT systems. Such systems play thus nowadays an important role in the continuous reproduction of the organisation.

The existence of many agents within an organisation and many performed actions gives rise to a need for coordination. This means that different agents should be adapted to each other and that different actions should be adapted to each other. An organisation exists through multi-action and multi-agent constellations. Organisational coordination is mainly pursued through communication. But it is important to acknowledge that different artefact arrangements have coordinative forces in the organisation.

An organisation interacts with outside actors, which they are dependent on. It serves clients with products, and it is served by suppliers providing pre-products. An organisation ceases to exist if it cannot serve other parts of the society. Communication plays an important role in an organisation's interaction with its environment. Business agreements are developed and established through communication. Mutual commitments are created and resolved in interactional patterns. Such commitments must be forwarded into the organisation and remembered for future actions (e.g. for fulfilment of commitments). IT systems play roles in the organisation's communication with outside actors. Important functions of IT systems are to exchange proposals and commitments and to keep a memory of the proposals and commitments made.

Humans are becoming agents of an organisation when they are enrolled. Enrolment is performed through communicative acts (agreements). To appear as an organisation agent means to act on behalf of the organisation, as a representative. When being organisational agents, humans are assigned and appointed to organisational roles. In order to exert an organisational role in a competent way, the agent must learn rules and routines of the organisation. It is necessary to adapt the conduct to other agents of the organisation as well as to actors outside the organisation. Hence communication plays important roles when a human becomes and remains an agent of the organisation. But communication is not enough. As an employee there is a need for monetary compensation for the work performed.

IT systems can also be agents of an organisation. A system can be purchased or in-house developed. IT systems are established through design actions based on human intentionality. These design actions are of communicative character and they have a regulative force for the functioning of the system. These established rules of an IT system (cf figure 2.3 above) govern the actions of that system in its organisational use context and thus maintain organisational patterns. But communication is not either enough in this case. There is a technological base for IT systems providing hardware and software for executing rule-governed artificial behaviour. This rule-governed behaviour implies performance of pre-defined communicative actions. These communicative actions of the IT system have impact on the actions performed by humans within and outside the organisation. Some actions (in interactive use situations) are performed by humans and IT systems together. These actions are co-produced by the human and artificial agents. The different agents have of course distinct roles in such co-operation based on their respective human and artificial character.

In order to create an integrated understanding of organisations and information systems there is a need for understanding of

- human action and social interaction,
- communication as creation and interpretation of signs,
- usage of technology and artefacts, and
- how these phenomena interplay in organisational settings

Our brief contribution to such an integrated understanding has in this section mainly been pursued by posing some fundamental questions and giving some answers to these questions. Furthermore, a theory on organisations and information systems should, according to our view, be built on some basic constructs. These constructs are

- Actions (of different kind; e.g. communicative, interpretative or material character)
- Performers (actors/agents) of actions (organisations, humans, artefacts)
- Action objects as preconditions and results (of signifying or material character)
- Patterns of actions
- Relations between actors established through social actions

Our claim is that these categories form a fundamental basis for development of a theoretical understanding concerning

- Organisations
- Information systems
- The relations between organisations and information systems

6 Conclusions

The base for this paper was three existing theories (within a theory family) concerning business interactions (BAT), workpractices (ToP) and information systems (ISAT). The starting point was unclear relations between the theories. This gave rise to our purpose to clarify and integrate the theories.

In this paper we have pursued the following. We have:

- clarified relations between the theories of ToP, BAT and ISAT
- given a proposal to conceive ISAT and BAT as magnifications of ToP (i.e. ToP has "parent relations" to ISAT and BAT)
- taken steps towards an articulation of the underlying theoretical thread: "Socio-instrumental pragmatism", which serves as a progenitive theory for the other theories
- exemplified and compared the four theories by the use of a common example
- proposed changes in the three theories with purpose of convergence: They should be more transparent to each other through a borrowing of concepts implying more harmonious concepts and terminology (mutual adaptations)
- sketched essential constructs and principles of an integral theoretical understanding of organisations and information system

Our change proposals should be seen as improvements of each theory as well as of the theories all together (the theory family). Our work should be seen as steps towards a more integral view on information systems and organisations. We believe that the route towards such an encompassing understanding goes through an enhanced understanding of socio-instrumental actions. There is a need for further research in this direction. Future development

of the four theories (SIP, ToP, BAT and ISAT) should be pursued concomitantly and with the purpose of giving further contribution to the requested need for integral understanding.

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