

## Context in Focus: Transaction and Infrastructure in Workpractices

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### Abstract

Information systems appear in work contexts. There exist several conceptualisations of IS context. The paper investigates two such context conceptualisations: workpractice vs business process. The workpractice theory of Goldkuhl & Röstlinger has been studied. Two new concepts (transaction and infrastructure) have been introduced and added to the theory. Different workpractice conditions have been classified as transactional or infrastructural. This conceptual extension enables the workpractice notion to include business process as a clearly defined part.

**Keywords:** Workpractice, practice, business process, information systems, context, workpractice theory

## 1 Introduction

Information systems (IS) are used by humans when performing work. IS are always situated in some work context. The need for recognizing the work context of an IS is well acknowledged. The function and content of an IS will be determined by features of its work context. There are however disagreements how to conceive this IS context. The context can be labelled in different ways and these different labels also entail different perspectives on the IS context. There exist at least the following concepts to designate the context of IS:

- Activity (e.g. Nardi, 1996; Andersen, 2003)
- Human activity system (e.g. Checkland, 1981)
- Work system (e.g. Alter, 2002)
- Business process (e.g. Davenport, 1993)
- Practice (e.g. Wynn, 1991; Orlikowski, 2000; Goldkuhl & Röstlinger, 1999)
- Workpractice (e.g. Clarke, 2003; Goldkuhl & Röstlinger, 2003ab)
- Habitat (e.g. Brynskov & Andersen, 2003)
- Context (e.g. Roque et al, 2003)

There is however some ambiguity in the IS context concept. 'Context' is often used to designate the environment of something. The surrounding of an IS is its context. The etymological meaning of 'context' is weaving together<sup>1</sup>. The IS is not only situated in a weave of actions; it is usually also considered to be a part in this action weave. Context can thus mean both the *surrounding* of an IS and the larger *composite* which the IS is a part of. This implies that sometimes it might be unclear if one means the context including the IS or the context excluding the IS. In this paper we consider IS context to be the larger composite which an IS is an integrated part of.

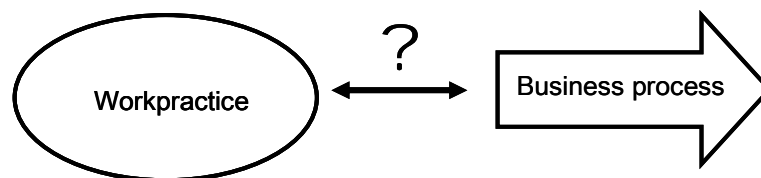
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<sup>1</sup> From Latin contextus "to weave together," from com- "together" + textere "to weave" (Online Etymology Dictionary, [www.etymonline.com](http://www.etymonline.com)).

This paper is devoted to an analysis of the concept of IS context. It is beyond the possible scope of the paper to make a broad comparison and analysis of all the above mentioned conceptions. We will primarily look into one conceptualisation of context (workpractice). To learn more about this concept we will relate it to another context concept (business process). At ALOIS2003 we presented a workpractice conceptualisation (Goldkuhl & Röstlinger, 2003a). At ALOIS2005 a panel was dedicated to workpractice theory (Goldkuhl, 2005a). It is important to continue this discussion.

In Goldkuhl & Röstlinger (2003a) a minor comparison was made between the workpractice and the business process concept. This pursued analysis cannot however be considered as full-blown. The business process notion has had a tremendous impact on practical IS work since the beginning of the 90'ies. Therefore it is important to look into the workpractice concept and see how it is related to the business process concept (figure 1). In what ways can a workpractice be conceived to be a business process? By relating these two conceptualisations to each other the understanding of IS context may emerge. This purpose of the paper will be further sharpened in section 3 below.

The main approach of this paper is a conceptual analysis. We will penetrate the workpractice theory and especially the generic workpractice model as were described in Goldkuhl & Röstlinger (2003a). In the analysis of the workpractice theory we will partially use a business process lens. As a result of this analysis we will propose a revision of the generic workpractice model (ibid). We will also introduce two main categories for describing workpractices: transaction and infrastructure. As a consequence of this conceptual augmentation the workpractice model in Goldkuhl & Röstlinger (2003a) will be altered. In this conceptual analysis of the two context notions (workpractice vs business process) and related concepts, we will discuss and evaluate different meanings. Concepts and alternative terms are analysed. It is not an easy task to chose appropriate terms. Different lexical definitions and etymological meanings are investigated and assessed.



*Figure 1: How are the concepts of workpractice and business process related to each other?*

In the next section we will give a brief overview of the workpractice theory following the description in Goldkuhl & Röstlinger (2003a). In section 3 we will discuss the business process notion as a basis for the main analysis of the paper. In section 4 we describe the revision of the workpractice theory by the use of the concepts of transaction and infrastructure. In the last section we are summarizing our insights from this analysis.

A note on the title of the paper which otherwise may provoke some readers. Sometimes the concepts focus and context is used as complementary pair as in psychology and linguistics (foreground vs background). If one foregrounds the background (i.e. focuses the context), it will no more be a background in such an analysis; it will come to the foreground. Therefore some people might argue that focusing context, as a context, is impossible. However, we must name this specific focus shift in some way, and we find it appropriate to call it "context in

focus”, which is similar to what some linguists call “foregrounding background” (Allwood & Hjelmquist, 1985).

## 2 Workpractice theory

The practice notion has encountered an increased interest in contemporary social science. Schatzki et al (2001) is a compilation of articles under the label “The practice turn in contemporary theory”. Confer also Schatzki (1996) and Scollon (2001). A practice is considered to be “embodied, materially mediated arrays of human activity centrally organized around shared practical understanding” (Schatzki, 2001 p 2). A practice is not a single action; it is rather a constellation of actions. A practice is something that is exercised habitually or customarily; not just a “happening”. This means that certain proficiencies may be associated with a practice. The practice notion also acknowledges the materiality of real practices. Practices are social but not only social. Practices embrace communication and knowledge, but they also go beyond this. In practices, people are influenced and act through the concrete materiality of the world.

When reading Schatzki et al (2001), practice is a rather general notion with a fairly broad coverage. In, Goldkuhl & Röstlinger (1999) we used ‘practice’ as the main label when introducing our theory (ibid). Later, we have made a delineation to ‘workpractice’ in order to make explicit the work character of our practice notion (e.g. Goldkuhl & Röstlinger, 2003a). A workpractice is not just performing something. It is performing something in favour of someone. This is an important feature of the workpractice theory.

A workpractice consists of people (the producers) acting in favour of some people (the clients). The producers create results (products) from the workpractice aimed for the clients. This means that workpractice theory emphasizes the intended results and the intended receivers/users of these results. If it was not for the clients and their needs for products (goods/services), the workpractice would not exist. A workpractice gets its social legitimacy from the needs of its clients. A workpractice consists thus of actors (producers), their actions and accompanying results. Producers do not create results out of nothing. They need conditions of different kinds in order to produce results. Such conditions can be material or communicative objects. Workpractices consists thus of conditions, producers, actions and results. Conditions/results are action objects. An action object is created through some action and used in some other action. Action objects are often given a materialised and persistent form, but some action objects (as e.g. oral utterances) are evanescent and evade after their production. To be sustained as a practice function, such an action object must be internalised and remembered after its original and immediate interpretation.

Actions are elements of practices, however not the only kind of element. To take a physical metaphor; an action is an ‘atom’ of a practice. An action constitutes together with other elements (actors and action objects) a ‘molecule’ of practice. *A practice consists thus of constellations of actors, actions and action objects.* Such a constellation means that someone (an actor) does something (an action) with (usually) several objects. Action objects play different roles in a workpractice. One of the core ideas of workpractice theory is to clarify the different roles action objects play in workpractices. An action object has one or more functions in a workpractice.

The workpractice theory (Goldkuhl & Röstlinger 2003a) has been crystallized in a generic model of workpractices (figure 2). In this model different categories of a workpractice have been depicted. The generic workpractice model has emerged over the years (e.g. Goldkuhl &

Röstlinger, 1999, 2003ab; Goldkuhl, 2005a). Workpractice theory is based on socio-pragmatic foundations often labelled socio-instrumental pragmatism (Goldkuhl & Röstlinger, 2003b; Goldkuhl, 2005b).

The workpractice model is a contextualised and relational model. It describes important relations to the environment, i.e. relations to essential actors in the environment. Following the discussion above, the clients are seen as the primary external actors. A workpractice exists in order to satisfy the clients through products. An interest in a specific workpractice should also render an interest in the clients' situations and their use and use effects of products from the workpractice. Product is comprehensive concept covering both goods and services; confer Goldkuhl & Röstlinger (2000) for an elaborated description of the product category associated with the workpractice theory.

Producers are humans. However, advanced machines can as well be able to perform certain actions. For example, IT systems can function as producers for certain types of formalized actions. The responsibility for such artefact actions resides however always in humans.

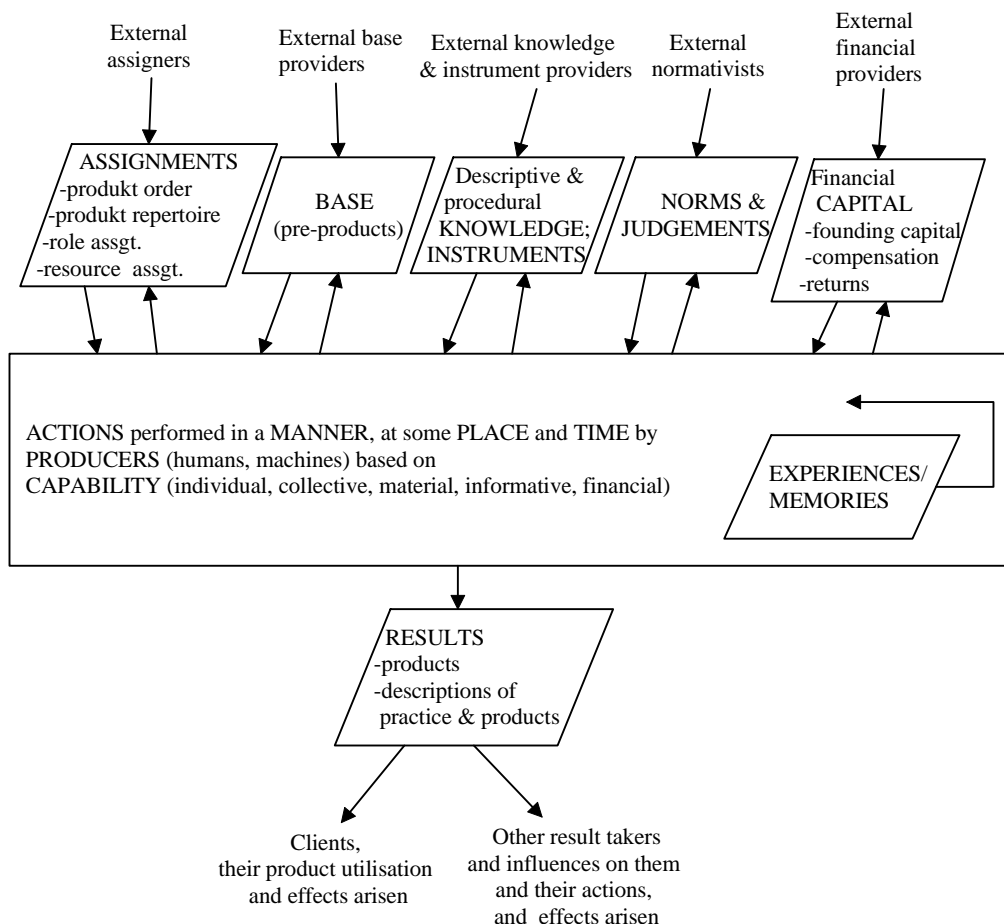


Figure 2: The generic model of a workpractice (from Goldkuhl, 2005a)

Assignments are initiatives for the production of results from the workpractice. Base is the “pre-products” which are transformed into products from the workpractice. Descriptive and procedural knowledge and instruments are utilised in the workpractice when producing results. The workpractice is also governed by norms and judgements. Financial capital is necessary for operation of the workpractice.

Important condition providers in the environment are also identified in the generic model. Conditions can be created by external actors and also by internal actors (i.e. the producers of the workpractice). This can be understood from the model; arrows to the conditions are coming from external actors and from the workpractice itself, i.e. from internal actors (producers).

Workpractice theory is a conceptualisation of workpractices as IS contexts. It is aimed to be used in IS related inquiries. In the process of information systems development (ISD) it can be used at early stage in order to delineate and characterize the surrounding workpractice of the IS to be developed. A workpractice definition can be made (Goldkuhl & Röstlinger, 2003a), using the categories of the workpractice model, in order to clarify the specific logics of the workpractice.

### **3 Business process vs. workpractice**

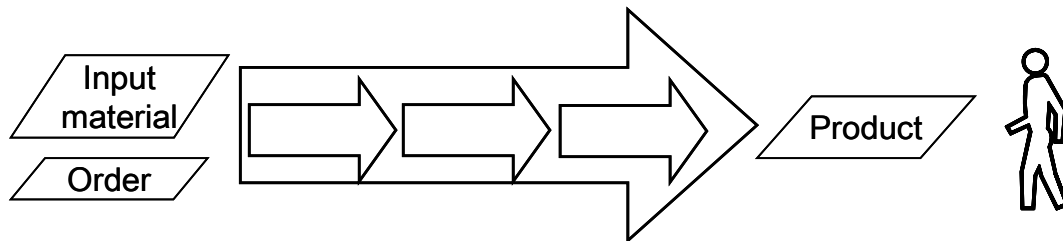
Organisational work can be seen as workpractices, as was described above. It can also be seen as business processes. Process orientation has won wide popularity since the beginning of the 90'ies. Two accompanying process waves have been spread over the world: Business Process Reengineering and Total Quality Management. Even if these “process schools” still can be talked about, one can say that they have merged into a general process orientation often labelled process management. Process orientation has had a great impact on the information systems area.

Processes are generally seen as structured sequences of activities and process orientation usually also involves a customer focus (e.g. Davenport, 1993). However, the business process notion is not unequivocal. There are several possible interpretations of ‘business process’. Keen & Knapp (1996) identified two different process views; either to comprehend business processes as transformation or to comprehend business processes as coordination. Lind (2002) has furthered this analysis of process views; confer also Goldkuhl & Röstlinger (1999). The transformative dimension is about focusing the transformation of input (raw material) to output (the finished product to be utilised by the customer); *process as workflow*. This can be said to be an industrial view of business processes, well founded in Total Quality Management (Harrington, 1991). The coordinative dimension is about focusing the creation, fulfilment and assessment of agreements between and within organisations; *process as interaction*. The latter dimension concerns thus patterns of interaction within and between organisations; how orders/assignments are given, accepted and forwarded. Communicative aspects are stressed in the coordinative perspective. This coordinative view is well founded in the language-action tradition (confer e.g. Medina-Mora et al, 1992 and Dietz, 1999).

Lind (2002) argues that these two process views should not be seen as strict and exclusive alternatives. Although these views can be seen as antagonistic (as thesis vs antithesis), there is a possibility to integrate these views into a synthesis (ibid). A process is a sequence of activities, based on input material and an order (assignment). The order has a coordinative force in the transformation of input material to product. Confer figure 3 which is based on Lind & Goldkuhl (2005).

These two process views share a common “horizontalisation” of organisational work. The vertical dimensions of power, control and authority are usually put aside in process analysis of either kind.

In Goldkuhl & Röstlinger (2003a) we analysed these two process views and their possible relations to workpractice theory. We concluded that workpractice theory share some essential assumptions with process orientation. Customer focus is well acknowledged in these theories. In workpractice theory, the more general ‘client’ notion is used instead of ‘customer’. Anyway, this terminological difference does not have significance concerning the emphasis towards the beneficiaries of the workpractice/business process. Workpractice theory acknowledges the transformative dimension; inputs are refined into outputs (products). It acknowledges also the (horizontal) coordinative dimension; negotiations, agreements and commitments between clients and producers.



*Figure 3: A combined view on business processes - as transformation and coordination (based on Lind & Goldkuhl, 2005)*

In Goldkuhl & Röstlinger (2003a) we claimed that although there are important common features between process orientation and workpractice theory there are also several differences. One important difference is that process orientation has a horizontal emphasis. In workpractice theory vertical coordination is well acknowledged besides horizontal coordination and transformation (ibid).

Besides vertical coordination, there are other aspects in workpractice theory which are not so much recognized in process orientation. Several of the workpractice categories (see description above in section 2) are usually not found as explicit categories in process frameworks. For example the categories of descriptive and procedural knowledge, and of norms and judgements are seldom found as explicit categories in process oriented approaches. ‘Workpractice’ and ‘business process’ can be seen as two different lenses to look at organisational work. A workpractice lens emphasizes certain practice features and a business process lens emphasizes certain process features. When using a certain lens certain features are highlighted and other features are downplayed or even disregarded.

One conclusion from this is that the workpractice notion can be seen to be broader than the business process notion. A workpractice can be said to comprise one or more business processes (figure 4). There are aspects of a workpractice which are not made explicit in process orientation. If one could make the process aspect of a workpractice more explicit, then these two concepts of IS contexts could be made more compatible and transparent to each other. We will make such an attempt in the next section of this paper.

To frame this purpose in another way: Although there are some important similarities, workpractice theory does not stand out as a process framework. Would it be possible to emphasize the process aspects in workpractices and still keep the complementary expressiveness in workpractice theory?

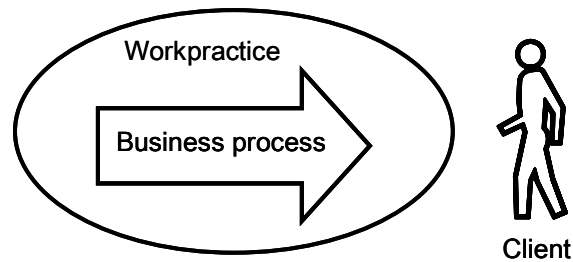


Figure 4: Business process as a subpart of workpractice

## 4 Transaction and infrastructure in workpractices

### 4.1 The concepts of transaction and infrastructure

A business process is a structured set of *activities* based on *orders* (assignments) and *input material* leading to *products* aimed for clients/customers (confer figure 3 above). When talking about a process these four categories should be kept together. In terms from workpractice theory, these categories are product order, base, workpractice actions and product. Business processes are usually repetitive. Business process are performed for several product orders; each process instance may be unique but share many features with other instances of the same kind. Each time a client (or a proxy for a client) makes an order, a set of workpractice activities must be performed. Every such process instance (consisting of product order, base, activities and resulting products) form a uniting *transaction*.

We make thus an important distinction between process type and its different process instances. A process instance (as a constellation of objects and actions) is conceived as a transaction. A workpractice comprises usually several transactions of the same type over time.

However, not all conditions in a workpractice can be seen as transactional. For example instruments are usually utilised in many instances of work. This means that an instrument is *not unique* for each transaction as a product order is. The same instrument may be used in several transactions of the *same type*. There are also other conditions which *do not vary* according to different transactions. For example quality norms regulate what is expected from all process instances of one kind and perhaps even from instances of several kinds. Norms are thus formulated in relation to *types* of transactions and not to a particular instance. Such conditions which function *for types of transactions* are here called *infrastructural conditions*. Conditions which function *as specific parts of transactions* are here called *transactional conditions*.

We distinguish thus between transactional conditions and infrastructural conditions. The transactional dimension is well in line with a process view. A transaction is the horizontal coordination and transformation activities well acknowledged in process orientation. A business process is a pattern of recurrent transaction instances.

Some comments on the terms ‘transaction’ and ‘infrastructure’ will be made. The word transaction has its origin from Latin *transacionem*, with the meaning “agreement, accomplishment” (Online Etymology Dictionary; <http://www.etymonline.com>); coming from the compound Latin verb *transigere*, with the meaning “accomplish, drive or carry through” from *trans-* “through” + *agere* “to drive” (ibid). The following meanings can be found in dictionaries: “A transaction is an agreement, communication, or movement carried out

between separate entities or objects” (Wikipedia; <http://en.wikipedia.org>) and “an exchange or transfer of goods, services, or funds” (Merriam-Webster OnLine Dictionary; <http://www.m-w.com>). We bear in mind the *double meanings of agreement and accomplishment*. In a transaction we include both the agreement of doing something and the accomplishment of this doing. This is fully in line with what has been stated above concerning the transactional dimension; both assignment and transformation. The concept transaction is also used in process oriented frameworks with a meaning of similar kind (e.g. Dietz, 1999). In computing a transaction has a much more restricted meaning. Since we are not focused on computing issues, we use ‘transaction’ with the broader meaning of agreement and accomplishment which is in line with a workpractice perspective.

Infrastructure has the meaning of “the underlying foundation or basic framework as of a system or organization” (Merriam-Webster OnLine Dictionary; <http://www.m-w.com>). Another dictionary definition is: “Infrastructure, most generally, is the set of interconnected structural elements that provide the framework for supporting the entire structure. It usually applies only to structures that are artificial. The term is used differently in a variety of fields; perhaps the single most well-known usage is in economics, where it refers to physical infrastructure such as buildings and roads” (Wikipedia; <http://en.wikipedia.org>). Infrastructure is a compound word of ‘infra’ and ‘structure’. Infra originates from Latin *infra* “below, underneath, beneath” (Online Etymology Dictionary; <http://www.etymonline.com>). “Underlying supporting elements” can be summarized as an appropriate meaning of ‘infrastructure’. In our definition of a workpractice infrastructure, we do not delimit ourselves to physical elements (like instruments). We also include other basic communicative and financial elements. Communicative elements can be descriptive, prescriptive, regulative, normative and evaluative. *Infrastructure is what is used for recurrent transactions, both for support and governance.*

## **4.2 Some conceptual and terminological issues**

During application of workpractice theory, we have discovered some conceptual and terminological problems that need to be resolved. We have found it problematic to talk about descriptive knowledge and procedural knowledge. It may be confusing to use the term knowledge in relation to these categories. These are the conditions for actions and as such externalised action objects in the same way as assignments, norms and judgements are. These action objects are all examples of communicative objects, i.e. objects that have a communicative intent and referent. Knowledge is expressed, orally or in writing, into statements or other symbols. This means that descriptive knowledge is expressed as descriptions and procedural knowledge is expressed as guidelines. This is similar to that normative knowledge is expressed into norms and evaluative knowledge is expressed into judgements. Workpractice knowledge is what human actors know, and this should be seen as part of the producer’s capability. Based on this argumentation we propose that these workpractice categories, descriptive knowledge and procedural knowledge, change labels to *descriptions* and *guidelines*.

The term ‘base’ (i.e. pre-products) in the workpractice model will be inappropriate when introducing a differentiation into transactional and infrastructural conditions. Infrastructural assignments will be labelled base assignments and we will also introduce the term base capital for infrastructural capital (see section 4.3 below). It should be confusing to keep the term ‘base’ as in the earlier model. Therefore, we suggest another term to be used instead of base (as pre-products): ‘*Substance*’ is the term we propose. Substance can be both material and



immaterial stuff, which well reflects the desired generality. “Substance is that element of an object without which it would not exist” (Wikipedia Dictionary; <http://en.wikipedia.org>).

In the earlier workpractice model (figure 2), there was an action object “experiences/memories” placed inside the producer/action square. We think this is inadequate. Either “experiences/memories” are actor internal or they are external to actors as separate action objects, in the same way as other conditions/action objects. External memories (like registers etc) have a historical and descriptive role in the workpractice. Such memories can however be covered by the action object descriptions (re-labelled above). The continual learning through experiences from acting is an important aspect of workpractices. This is closely related to the evolution of actor/producer capability. We will bring these two aspects (experiences & capability) together in the new model proposed below (figure 5). This means that the internal object “experiences/memories” has been excluded in the revised model.

### 4.3 Classification of workpractice conditions

We used above some examples to differentiate between these two types of workpractice conditions. Product order and substance were seen as examples of transactional conditions. Instrument and norm were seen as examples of infrastructural conditions. We have to look closer at the different workpractice categories and see how they fit into this differentiation. This is done in table 1 which will be commented below.

*Table 1: Workpractice conditions classified into transactional vs infrastructural conditions*

<b>Workpractice categories</b>	<b>Transaction</b>	<b>Infrastructure</b>
<i>Assignments</i>	Product orders	Product repertoire, Role assignments, Resource assignments
<i>Substances (earlier labelled base)</i>	Substances (can be material and/or informative/ descriptive substances)	-
<i>Instruments</i>	-	Instruments
<i>Descriptions (earlier labelled descriptive knowledge)</i>	See substances above	Descriptions (preserved descriptions)
<i>Guidelines (earlier labelled procedural knowledge)</i>	-	Guidelines
<i>Norms</i>	-	Norms
<i>Judgements</i>	Transaction judgements	Practice judgements
<i>Capital</i>	Compensations	Base capital

As said above, product order is a proper example of a transactional condition. A *product order* is the main initiating force in a transaction. But there are also other assignments in the workpractice theory. *Product repertoire, role assignments, resource assignments* are all examples of infrastructural conditions. A role assignment is given to a person (or group of persons) in the workpractice concerning their duties; what kind of work that is expected. A role assignment is not given for a specific transaction; it is given for types of transactions. A role assignment prescribes what typical job tasks a person should accomplish. If there are specific work expectations connected with a particular transaction, these are seen as part of

the product order or consequences (i.e. refinements) of that product order. The product repertoire of a workpractice defines the product types that the workpractice should produce. Resource assignments (like a budget) are also concerned with types of transactions. If there are specific resource restrictions for a particular transaction, this is seen as part of the product order and the connected compensation (see below). These three types of infrastructural assignments (role assignments, product repertoire, resource assignments) can be called base assignments in contrast to product order which can be called transaction assignment.

When a product order has been effectuated, information about this can be memorized in the workpractice. If so, such product order statistics will be part of the workpractice's descriptive infrastructure. It is, however not the product order, in the role of a transaction assignment, that is kept in the workpractice memory (infrastructure). It is a record (a description) of something performed. After being performed, it has no longer the regulative role of an assignment.

Substances are the "raw products" (pre-products) used for transformation into products. The substances will be a transformed part of the finished product. Examples of different kinds of substances and products are: tree and metal are transformed into a chair; a sick patient is treated and becomes a healthy person; medical records are processed into medical statistics. This means that substance definitely is a part of the transaction. Substance is not part of the infrastructure. However there can be interesting transitions between substance and descriptive infrastructure, which will be described below.

Substances are often "consumed" during production. Material stuff, that is substance, is transformed into the material result, that is the product of the workpractice. As said above, tree and metal objects are transformed into a chair (product). The original substance objects do not longer exist as separate objects; they are now indispensable and integrated parts of the final product.

However, there is an important difference in relation to information products. The information substances (e.g. medical records) are not consumed in the same way as material substances, when the result (medical statistics) is produced. We can use information over and over again without destroying it. As substance, information can be preserved. This means that information as substance can be kept over time as a kind of memory and thus part of the descriptive infrastructure. There are, thus, examples where descriptive objects in a workpractice can have roles of being both substance and infrastructure. Such examples are described below; medical records as both descriptive infrastructure and different kinds of substances.

We distinguish thus between material and informational substances. When producing material results material substances are needed. Informational substances (usually descriptions) are used for production of informational results. However, material substances can also be used when producing informational results. For example maps (information product) are created from impressions of what is mapped (some materiality). In this case the material substances are not consumed, only inspected.

When creating material products, there can also exist informational substances. There can be descriptions that accompany the material stuff and which are necessary as an informative base for the production of the material result. We will describe this below when discussing the roles of descriptions.

We used above *instrument* as an example of an infrastructural condition. Many instruments will function as general and recurrently used devices in transaction instances. Tools and equipment are usually procured to be used in many situations and not for a single occasion. There might, however, be exceptions to this. Some instruments can be procured or developed for use in a specific transaction. General instruments (as part of the workpractice infrastructure) may also be adapted to a particular transaction instance. In such cases there will be a preparatory stage, before the transactional process, where the infrastructural conditions of instruments are provided; i.e. an infrastructural pre-transactional process. In this instrument process, certain characteristics of the specific transaction may be taken into consideration, e.g. through the transaction assignment (product order) that specifies requirements on the transaction process. Instruments have a supportive character in relation to the transaction process. This makes general instruments as well as transaction specific instruments parts of the infrastructure. Instruments that are modified or procured for a specific transaction, may later be re-used as (general) instruments for recurrent transactions.

A similar reasoning can be applied to *guidelines*. Many guidelines are formulated as prescriptions for use in many transactions. They are thus parts of the infrastructure. However, there may exist transaction specific guidelines as well. Guidelines can be designed for a specific transaction; e.g. when a method is developed or adapted for a specific system development project. Such a method is transactionally adapted, but still (through its supportive character) an infrastructural condition.

Another workpractice category is *description*. This is externalised “factual” knowledge about important circumstances in and outside the workpractice. Such descriptions are used in order to facilitate actions in the workpractice. Descriptions are contrasted to guidelines which support and direct actions in specific ways. Descriptions are supportive but in less distinct ways and have more of an orientation role. A description is “what is” and a guideline is “how to do”. Descriptions are infrastructural conditions. There might be descriptions about general issues which are used in many transactions. There might also be descriptions about specific objects; e.g. description of a client. Such client-specific description can however be used in many transactions.

There may be descriptions of specific transactional objects and these descriptions can be used in transactions. This makes such descriptions transactionally specific. Such descriptive knowledge can be used as a direct basis for the production of result. When this is the case, such descriptions will be parts of the substances of the transaction as mentioned above. They will be necessary conditions and ingredients for the production of the workpractice result. We will below give some clarifying examples when descriptions are used as substances.

Sometimes a medical practice contributes to research with medical statistics. Such medical statistics is then an information product from that medical practice. Different medical records are thus input to the generation of the medical statistics product. In such a case the medical records have also the role of substance for generating the product. The medical records may have a role of infrastructural conditions in other parts of the medical workpractice. This is one example that objects in a workpractice can play different roles (i.e. have different functions) for that workpractice. In this case a transactional substance role vs a descriptive infrastructural role.

Another example: During treatment of a patient, much specific knowledge about this client is generated (test results) which are used in the treatment process (the transaction). These

descriptions are used as substances (together with the patient himself) for treatment of this patient. Such substances (descriptions) can later on be transferred into descriptive infrastructure when used in subsequent transactions. Information in a patient's journal may be a substance (a transactional condition) when recorded during a transaction and used as a basis for treatment. But later on this information will provide an overview about the patient's medical history and is possible to use in many treatment situations (i.e. subsequent transactions). These historical records will thus be an important part of workpractice's descriptive infrastructure (preserved descriptions). However, earlier medical records may be used as descriptive substances in future transactions. This means that parts of a descriptive infrastructure may sometimes have roles of a substance as already said above.

Medical records can be used for further development of the infrastructure of medical workpractices. Through reflection and analysis, knowledge about a specific patient, together with knowledge about other patients, may be transferred to more general knowledge useful for future potential patients as well. Such general knowledge is an important part of the medical workpractice's descriptive infrastructure.

*Norms* are value expectations on workpractices and their products. Norms tell what to do and what not to do in typical situations. We classify norms as pure infrastructural. Norms are rules with application to more than one specific situation (transaction). There may of course be desires concerning specific transactions. Such desires are not seen as norms. They will probably appear as parts of product orders.

*Judgements* can concern a specific transaction or the workpractice as a whole. This means that judgements can be transactional or infrastructural. Assessments given by clients after delivery of a product (e.g. a complaint) is an important transactional condition which may lead to a renewed product delivery. Judgements of transaction instances can be generalised to an assessment of a transaction type. Such a generalised judgement functions as infrastructural condition and may be an impetus for workpractice improvement. General practice judgements do not need to originate from transaction instances. People (inside or outside the workpractice) may render general opinions about the workpractice. Such judgements are thus not transactional but infrastructural.

*Financial capital* can be provided to workpractice in different ways. Usually, clients pay for their products. Such a payment (*compensation*) is naturally part of the transaction. Capital provided by founders/owners cannot be seen as transactional. Such *base capital* is part of the workpractice's infrastructure.

#### **4.4 A revised workpractice model**

This analysis and classification of workpractice categories give rise to a need for restructuring the generic workpractice model (figure 2). The two dimensions of workpractice categories (transactional and infrastructural) are not visible in that model. We propose a restructuring of the generic workpractice model according to figure 5.

As can be seen from this figure, workpractice conditions are separated into two main categories: Transactional and infrastructural conditions. We have twisted the figure so the transactional level is shown as a horizontal dimension in an ordinary process fashion. The transactional conditions are used in the transactional activities leading to products for clients. Compare this to figure 3 where two main transactional conditions are shown. In the revised

model the infrastructural conditions are shown underneath. This corresponds well to the term infrastructure. See above about meanings of ‘infrastructure’ (infra = underneath).

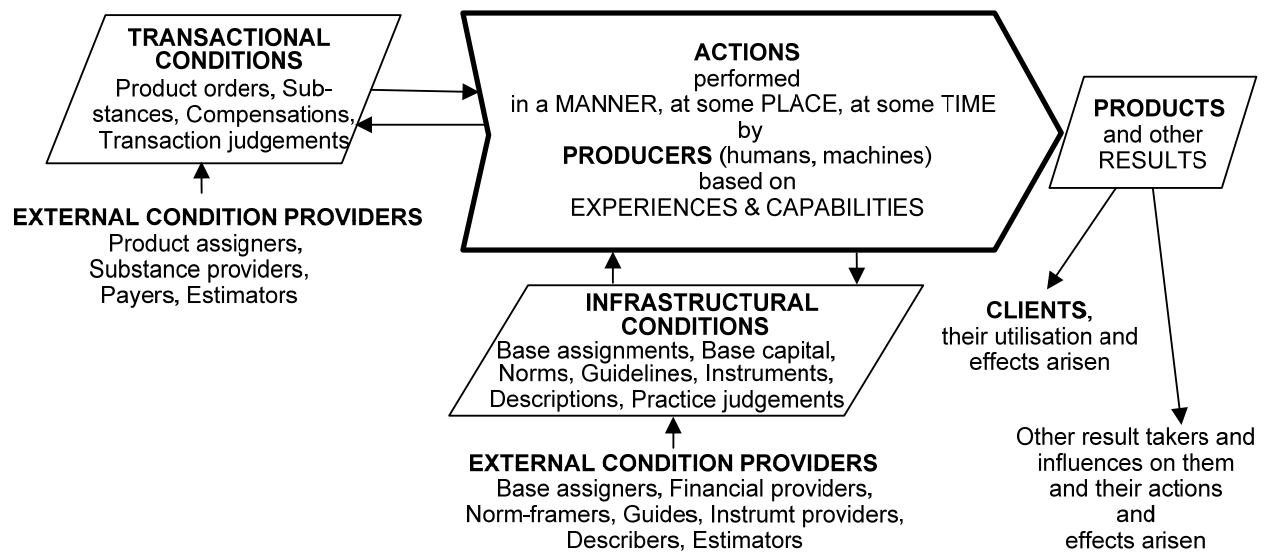


Figure 5: A restructured generic workpractice model

Transactional conditions consist of product orders, substances, compensations and transaction judgements. These are the categories which should, together with product, constitute a transaction. Product order and substance are mandatory. A compensation is not needed for all types of transactions. Sometimes financing can be made in other ways. Also transaction judgements are of optional or occasional character.

In the revised model we have made terminological changes already mentioned above (section 4.2). Base is replaced by substances, descriptive knowledge is replaced by descriptions and procedural knowledge is replaced by guidelines. The category experiences/memories has been excluded as such. Experiences are now described together with capabilities and externalised memories are seen as parts of descriptions (see section 4.2 above).

Based on the proposed revision of the generic workpractice model we also suggest a revised definition of workpractice. In Goldkuhl & Röstlinger (2003b) and Goldkuhl (2005) we have earlier presented definitions. To these definitions we add the differentiation of transactional and infrastructural conditions. A revised definition reads as follows:

A workpractice means that some actors make something in favour of some actors, and sometimes against some actors; this acting is initiated by assignments from some actors, and is performed at some time and place and in some manner, and is based on material, immaterial and financial conditions of transactional and infrastructural character and a workpractice capability which is established and can continuously be changed.

#### 4.5 A business process as a part of a workpractice

One purpose of the paper was to relate the concepts of workpractice and business process. Through the concepts of transaction and infrastructure this coupling has been made. The transaction concept is an integrated process concept built up from transformation and horizontal coordination (assignment) as described in section 3 above. These aspects have been brought out in the revised workpractice model (figure 5), based on an analysis of the earlier workpractice model (figure 2). What is left besides this transaction concept is the infrastructure of the workpractice. This means that a workpractice consists of transactional (business) processes and its underlying infrastructure. We have depicted this in figure 6, which can be seen as an answer to the research question stated in section 1 and 3 above and illustrated in figure 1. A provisional answer was given in figure 2, where a business process was said to be a part of a workpractice. Which other parts that exist in a workpractice were not explicated in that figure. In figure 6 we have explicated that transactional (business) processes and infrastructure together form a workpractice. In the transaction we include conditions, producers, actions and results following the reasoning above. The infrastructure includes, besides the infrastructural conditions, actions and performers in the workpractice dealing with (re)production of infrastructural elements.

The division into transaction and infrastructure in a workpractice means also a differentiation into activities of different frequencies. The transaction processes are fast “pulses” in the workpractice. The creation and recreation of infrastructure is a slower “pulse” in the workpractice. The two types of “pulses” are different but both are necessary for a workpractice operating with high quality.

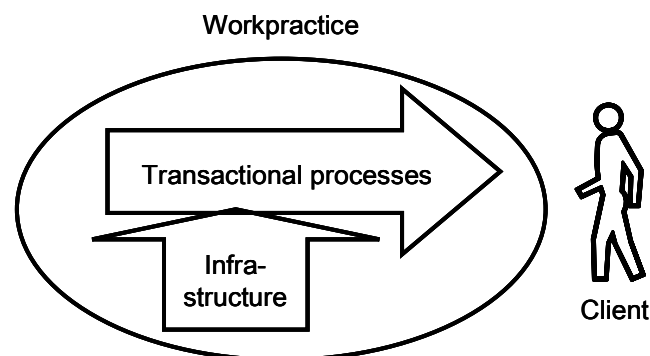


Figure 6: Transactional processes and infrastructure form together a workpractice

#### 4.6 Workpractice propositions

The revised generic workpractice model (figure 5) can be seen as crystallization of the workpractice theory. It can be used when investigating particular workpractices e.g. during ISD. It can also be used to guide researchers and other inquirers for other types of empirical inquiries of workpractices. The model can also be used as theoretical basis for developing specific workpractice theories, i.e. a theory for a particular domain e.g. eldercare, car manufacturing, retailing. However, the generic model, as giving a condensed generic picture of a workpractice, does not “tell the full story”. It is necessary to add more flesh to it. So has been done in earlier writings on workpractice theory (e.g. Goldkuhl & Röstlinger, 1999; 2003ab). However, to these earlier descriptions we would like to add *ten workpractice propositions*. These propositions summarize, to our opinion, the contents of the workpractice theory. Workpractice theory means a particular way of inquiring and theorizing about

workpractices. How does one think in workpractice-theoretic way? This is what we have tried to express in these ten propositions which read as follows:

1. A workpractice is usually *arranged* to deal, in knowledgeable and professional ways, with *recurrent demands*. A workpractice is usually performed within an *organisational setting*. *Producers* of a workpractice *represent* the organisation through their actions.
2. A workpractice creates *products aimed for clients*. Products are *used* by clients and thereby creating (intended/unintended) *effects*.
3. Work in a workpractice means *multifunctional actions*
  - performed by producers (human or artificial)
  - using objects (conditions)
  - producing objects (results/products)
4. Action objects/conditions influence what is done in a workpractice and how it is done. Different *conditions* have *different functions* for the workpractice. One condition may have several functions for the workpractice.
5. *Conditions* of a workpractice are *furnished* by external providers or internally by its producers.
6. A workpractice *transaction* is initiated through some *assignment* and implies a *transformation of substance to product* based on some *compensation*. A workpractice transaction consists thus of product assignment, substance, compensation, transaction work and product and sometimes also transaction judgement.
7. Recurrent workpractice transactions are supported and governed by *infrastructural conditions* (of communicative, material and financial characters). Infrastructural conditions can be base assignments, base capital, norms, guidelines, instruments, descriptions, practice judgements.
8. A workpractice exists in a *web of social relations* between producers and clients/result takers and between producers and condition providers. Relations are created and modified through actions/action objects.
9. A workpractice relies on an established and exerted *capability*. This means also that a workpractice usually is performed according to *institutionalized manners*. Workpractice performance creates *experiences* which function as *learning* and a basis for *capability evolution*.
10. A focused workpractice can often be considered to consist of several *co-functioning sub-workpractices*.

## 5 Conclusions

In this paper we have made an analysis of the information systems context. Two context notions have been investigated and related to each other (workpractice vs. business process). The workpractice theory earlier described in Goldkuhl & Röstlinger (2003a) has been the primary target. That workpractice notion (ibid) has been compared with conceptualisations in business process frameworks. The main result of this analysis is the introduction of the

concepts of transactional and infrastructural conditions. The generic workpractice model in Goldkuhl & Röstlinger (2003a) has been revised as a consequence of this conceptual development.

Through this conceptual development the broader workpractice notion has been clearly related to the popular business process notion. The paper has described in what ways a business process can be conceived as a part of a workpractice. This will make the workpractice theory more useful in business process development endeavours. When using a traditional limited business process concept there is a risk that the inquirers will disregard important infrastructural issues. A business process notion, well founded in a broader workpractice notion, will diminish such a risk. The division into transactional and infrastructural conditions will hopefully lead to more clarifying workpractice definitions which are important in information systems development and other change processes.

Future research will take these conclusions/assumptions as hypotheses for empirical studies. The practical contributions of this conceptual differentiation should be studied.

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