

The significance of workpractice diagnosis: Socio-pragmatic ontology and epistemology of change analysis

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Abstract

Change analysis (CA) is an investigation of an organisational situation in order to arrive at decisions concerning change measures. This means that CA should precede development of information systems and other change endeavours. The paper takes as its starting points earlier methods for change analysis (ISAC and SIMM). A need for a socio-pragmatic basis for CA is recognised. Such a basis should cover both ontology (what to study during CA) and epistemology (how to create valid CA knowledge). Different possible ontological bases for change analysis are investigated (business processes, human activity systems, workpractices). Preference is given to the concept of workpractice. Different methodological structures for CA are discussed. Workpractice diagnosis is found to be an essential part of CA. An example of a workpractice diagnosis (concerning emergency service in elder care) is used as an illustration. This example shows the application of some focal areas within workpractice diagnosis (as workpractice definition, process & activity analysis, problem analysis and condensed evaluation).

Keywords: change analysis, workpractice, socio-pragmatic, business process, method

1. Introduction: The significance of change analysis

The use of information technology (IT) for improving organisations is today so extensive that we simply tend to take it for granted. However, the use of IT is not the only proper answer to the question “how to improve an organisation”. There are other types of change measures. Development of information systems should not be taken for granted as *the* change measure, although it many times is an appropriate type of change. The concept of change analysis (CA) was introduced by Lundeberg et al (1978, 1981) as way to avoid an un-reflected decision of information systems development (ISD). Change analysis is seen as a separate activity to investigate some organisational situation in order to arrive at informed choices of action. The decided change measures should be seen as proper ways of resolving problems and obtaining the goals of the organisation. Not any change measure should be taken for granted. The understanding of different problems and strengths should guide the search for proper changes. CA should be performed in an unbiased way, which means that CA should be performed without any particular solution bias.

In relation to ISD, change analysis is seen as a separate and preceding step. Change analysis can lead to a decision to develop an information system, but it may also lead to other change measures as well as the decisions of not making any changes at all or even to the decision to close down some part of the enterprise. If ISD is chosen as a change measure in CA, there may also be other complementary changes decided upon. This is important since IS should not be seen as a universal solution. There might be other types of problems, which need other appropriate solutions. The result of a change analysis might many times be a “package” of change measures, which complement and support each other.

The performance of a change analysis will contribute to a well-informed decision concerning the development of information systems. The grounds for performing ISD will thus be explicitly stated. ISD will not be chosen as a change measure if it is not recognized as a proper solution to elicited problems. Change analysis will contribute to a decision concerning complementary change measures, in ways that a proper co-design of IS and organisation can be performed.

The concept of change analysis was originally operationalised into the ISAC method (Lundeberg et al, 1978; 1981). This method consisted of a principal structure of method steps: 1) analysis of problems, current situation and needs, 2) study of change alternatives and 3) choice of change approach. One of the main method components within CA/ISAC was the use of so called A-graphs (a method for describing activities graphically through stepwise decomposition).

Later on another method (the SIMM Method) based on the CA concept was developed. The development of the change analysis/SIMM (e.g. Goldkuhl & Röstlinger 1984; 1988; 1993) was based on a critical analysis of the ISAC method. The problem solving process in CA/ISAC was considered to be inarticulate. The problem solving process in change analysis was enhanced in CA/SIMM. More emphasis was put on analysis of problems, goals and strengths. Other method components were developed and incorporated in CA/SIMM; e.g. problem diagrams (Goldkuhl & Röstlinger, 1993) and action diagrams (Goldkuhl, 1992). One of the main features of CA/SIMM was an attempt to combine decision and problem solving rationality with a social and communicative rationality¹. The social and communicative rationality is mainly inspired by Habermas (1984; 1998).

Change analysis can in this perspective be seen as a process of intersubjectively establishing a diagnosis and a design ground for further organisational change. It is thus a social knowledge creation process and as such one can speak of its epistemology and ontology. The epistemology of change analysis implies *how to create diagnosis and design knowledge*. The ontology of change analysis implies *what to study*.

The development of CA/SIMM (as a second generation CA approach) compared to CA/ISAC (as a first generation CA approach) can be seen as a step towards a more socio-pragmatic approach. Especially the basic methodological perspective (i.e. epistemology) in CA/SIMM entails a more articulated socio-pragmatic procedure while emphasising the roles of different models in order to develop a shared understanding among participants. The ontology seems however not to be sufficiently sharp. The basic question here is “what is the character of the subject matter to be investigated?”.

The purpose of this paper is to take a step towards a third generation change analysis approach; a redevelopment of CA/SIMM. The line of development is towards a more articulated socio-pragmatic approach. We will not in this introduction make any closer argumentation for this choice of socio-pragmatism as a basic point of departure. The arguments will be shown through the paper.

¹ A general discussion on how to combine these different types of rationalities can be found in Törnkvist (2001) and Nilsson & Törnkvist (2001).

2 What to study in change analysis?

A change analysis is concerned with something, which potentially might be changed. It is an investigation of something that needs to be changed in some ways. What is the character of this something? All methods for organisational change and development carry with them, implicitly or explicitly, some general views on the matter to be studied. What possible ontological views are there for organisational change methods? We will in this section make a brief investigation on four possible views on what kind of phenomena to study in a change analysis. This means that we are looking at four different views on what is going on in organisations. The ambition is not to make a comprehensive inquiry concerning different organisational views. We choose four views which seem to have relevance for our intention to contribute to a more socio-pragmatic change analysis approach:

- business (transformative) processes
- business (coordinative) processes
- human activity systems
- workpractices

2.1 Business processes - as processes of transformation

The seminal papers by Hammer (1990) and Davenport & Short (1990) were the starting points for the business process reengineering (BPR) wave. During the 90'ies a business process view¹ became the ontological backbone for many change methods; old ones as well as new methods (e.g. Born, 1994; Ould, 1995; Österle, 1995). Many new approaches and methods were launched based on the business process concept. Hammer & Champy (1993, p 35) gave a short, but influential, definition of a business process: “a collection of activities that takes one or more input and creates an output that is of value to the customer”. This is a workflow view on organisations; some input is transformed, through a series of activities to some output. It is a horizontal view on organisations emphasising operational activities – how things are done instead of who decides according to the organisational chart. Davenport (1993, p 5) expresses it in this way: “a process view of the business ... represents a revolutionary change in perspective: it amounts to turning the organization on its head or at least on its side”. Turning the organisation on its side means precisely to change the perspective from hierarchical (vertical) view to horizontal processes. BPR was thus a move away from the traditional way of viewing organisation as a hierarchical structure. A main criticism, from BPR advocates, was that the traditional hierarchical view on organisations, embodied in the organisational chart, disregarded the customers. In the BPR view, the value to customers emphasised.

What basic phenomena appear when adopting this view? *Activities* performed in some order. Some *input* that is *transformed* to *output*. *Customers* who are the receivers of the output and who should appropriate a high *value* to the output. These are the basic phenomena that appear when adopting this view.

¹ In this section we talk about the business process view as it appears in BPR – the radical change approach. The view on processes seems in many aspects be similar to its “improvement cousin” of Total Quality Management (TQM); e.g. Harrington (1991). The difference between these approaches lies rather in the view of organisational change; radical vs piecemeal.

Let us discuss the merits and drawbacks of this view in short. Acknowledging activities, what is done, seems to be very important when making inquiries about possible changes in an organisation. The workflow approach, with a particular interest in how activities are ordered, should give important knowledge as a basis for change¹. The emphasis on customers and customer value seems to be an enduring contribution of BPR², even when this change approach now seems to fade away as a management fad.

There are many aspects of organisations, which are disregarded in a restricted business process view. As said above, issues of power and control are not in focus when adopting a business process focus. Even if there are certain merits in the workflow view, this can be challenged as a too restricted view, exclusively on transformations. We will now turn to an alternative view on business processes.

2.2 Business processes - as processes of coordination

The transformative view on business processes gives a powerful template for analysis. But what happens if this template is too restrictive? Keen (1997 p 17) gives warnings for usage of such a template: “The process-as-work flow definition excludes many processes that have no clear inputs, flows and outputs.” Keen emphasises in his criticism that processes involve coordination. This follows a basic view on organisations that they essentially are created through communicative action (e.g. Winograd & Flores, 1986; Taylor & Van Emery, 2000). Business processes are mainly coordination processes in this communicative view. Business processes arise through requests, offers, agreements and commitments and other communicative acts. The theoretical inspiration comes mainly from speech act theory (Austin, 1962; Searle, 1969; Habermas, 1984). The transformative view on business processes is rejected and as an alternative a communicative and coordinative view has been formulated.

There are several business process methods, which have been launched, based on this communicative view³. Action Workflow (Medina-Mora et al, 1992) and DEMO (Dietz, 1999) are two well-known examples. Action Workflow describes the business process as a loop consisting of four generic phases: 1. Preparation, 2. Negotiation, 3. Performance, 4. Acceptance (e.g. Medina-Mora et al, 1992). A customer and a performer are communicating in order to come to an agreement of what the performer shall do in favour of the customer (phase 1 and 2) and after the performance they communicate in order to come to an agreement on what has been done (phase 3 and 4). This is also expressed in the DEMO approach by the actagenic phase (an agreement about what to do) and factagenic phase (an agreement about what has been done); cf e.g. Dietz (1999).

The significance of these coordination approaches is the identification of generic communicative acts in business processes. Business processes are only performed by virtue of established agreements and commitments. Such agreements are recognised as having a basic governing force in the performance of business.

¹ We here disregard the BPR claim for a clean slate approach in organisational change (e.g. Hammer & Champy, 1993; Davenport, 1993). This means that one should not consider the current processes in some improvement endeavour – one should instead, through an innovative mode, invent a totally new process design. This question has to do with the design epistemology, rather than the organisational ontology, which is the theme for this discussion.

² We do not claim that this is a contribution only by BPR. In much marketing literature a customer focus is emphasised. This is especially the case in service marketing (e.g. Grönroos, 1990) and relational marketing (e.g. Gummesson, 1999).

³ This view is often called the language action perspective (LAP).

The coordinative approaches have identified blind spots in transformative approaches, i.e. their lack of explicit recognition of different communicative acts governing business processes. Unfortunately, these LAP approaches seem, however, to overemphasise communication and coordination at the expense of transformative and material actions¹.

One thing that transformative and coordinative process approaches have in common is that they both take a strict horizontal view on organisations. Vertical aspects power and authority are disregarded.

2.3 Human activity systems

We now turn our interest to some other approaches, which do not explicitly speak of business processes. These alternative views consider organisations as human activity systems. In Soft Systems Methodology - SSM - (e.g. Checkland, 1981) the ontology of this method is described in terms of human activity systems. Some basic constituents are defined within a human activity system. According to SSM a "root definition" of a human activity system should be made based on six generic categories expressed by the mnemonic CATWOE. A human activity system is constituted by a *Transformation* process (T) where some *Actors* (A) converts input to output directed towards *Customers* (C) who can be beneficiaries and/or victims; the transformation process is carried out in some *Environment* (E) and is controlled by some *Owners* (O) having the power to modify or demolish the system; the root definition is based on some assumptions - a *Weltanschauung* (W), which makes it meaningful in the actual analysis situation. As can be seen there are some resemblance - the focus on transformation and customers - to the transformative view (in section 2.1 above). But there are also important differences. The principals (i.e. owners) behind the activity system are explicitly recognised. When reading Checkland (1981), the way to analyse human activity systems seems to be quite different than a business process analysis.

Human activities are explicitly addressed in the well-known activity theory (e.g. Engeström et al, 1999). Activity theory builds on the work of the Russian psychologists Vygotsky (1962) and Leontijev (1978) with the notion of tool-mediated action as the main legacy. In the activity theory model by Engeström (1991, 1993) a basic ontology is conceptualised. A basic triad of subject - tool - object is complemented with other generic constituents on a more "social level": Rules, community and division of labour. Activity theory acknowledges explicitly both vertical and horizontal aspects of work. "The division of labour refers to both the horizontal division of tasks between members of the community and to the vertical division of power and status" (Engeström, 1993 p 67). This can be compared with the one-eyed emphasis on horizontal aspects of the two business processes views described above (sec 2.1-2).

Activity theory is an attempt to establish a unifying notion of an activity system. It is emphasising subjects, their labour divisions, objects and their transformation by the aid of tools and rules. Both material and symbolic aspects are acknowledged. There is however only one explicit role in the model: The actors (subjects) transforming objects to outcome. Other roles are only implicit. The relationships to environment seem to be dampened: "... influences from outside 'intrude' into the activity system." "The outside influences are first appropriated by the activity system, turned and modified into internal factors." (Engeström, 1991 p 128).

¹ Confer criticism in Goldkuhl (1996; 2001) concerning this matter. General criticism towards LAP approaches can be found in Ljungberg & Holm (1996).

The language action emphasis on establishment of agreements between different actors through communication and negotiation is not at all stressed in the same way in these two human activity approaches. Roles of language and its use for action are not explicitly considered. They both seem to have an emphasis on transformation. Engeström & Miettinen (1999 p 7) admits the lack of language and discourse orientation in activity theory: “Yet Wittgenstein’s legacy is a healthy reminder of a potentially one-sided emphasis on the physical, tool-mediated aspect of human conduct in activity theory”. “However, the integration of discourse into the theory of activity has only begun”.

2.4 Socio-pragmatic reflections

We have so far looked at three candidates for a change analysis ontology. They all have merits, but also shortcomings, which have been indicated above. With reference to these approaches we assert that an ontology for change analysis should include and build on the following aspects:

- The significance of the customers
- The ordering of activities for horizontal transformation
- Negotiations, agreements and commitments between customers and performers
- Recognition of both vertical and horizontal governance
- Tools as mediating human action

In this sense, what we present (below in sec 2.5) as a CA ontology can be seen as a synthesis of these approaches. But we would like to view it as something much more since we incorporate and develop several other issues. We have declared that our basic perspective is socio-pragmatic. It is therefore natural to investigate what the above-mentioned issues mean in a socio-pragmatic perspective. We start this investigation by looking at the notion of a social action. Weber (1978 p 4) made a classical definition of the concept of a social action: "That action will be called 'social' which in its meaning as intended by the actor or actors, takes account of the behaviour of others and is thereby oriented in its course". The definition it is not completely clear, and we make the following interpretations of it. A social action (performed by an actor) has social grounds (“takes account of the behaviour of others”) and social purposes (“thereby oriented in its course”). One of Weber’s followers, Schutz (1962) has made a distinction between “because-motives” (reasons for acting) and “in-order-to-motives” (intentions for action), which we consider to be in line with our interpretation.

A classical model of human action (cf e.g. von Wright, 1971) takes usually into account the following parts: An actor, within a situation that contributes with reasons (grounds) for action¹; the action that leads to results, which can further on lead to intended effects (purposes) as well as unintended effects. The grounds lie in the past and the presence and the purposes lie in the future. When we shift this classical model to a model of social action, we get grounds that are social, and purposes that are social; cf figure 1.

We take a simple example as a means for further illustration of our reasoning. A wife asks her husband to fetch some firewood since she thinks it is cold in the house. The husband leaves the house to chop some wood, which he then brings back to the house. We mainly use the

¹ We do not claim that the reasons as such are in the situation. The situation gives rise, through the actor’s interpretation of it, to reasons. This occurs in the first perceptive phase of an action; cf Mead (1938).

action of the husband chopping wood for illustrating a social action. Even if this is a material action performed in solitude, it should count as a social action. The action has social grounds and social purposes. It is part of a social interaction. We approach social interaction through concepts borrowed from conversation analysis (e.g. Sacks, 1992) and dialogue analysis (e.g. Linell, 1998). Sacks (1992) coined the term adjacency pair for directly related utterances. This has been further elaborated in dialogue theory in the conceptual pair of initiative and response (Linell, 1998). In a conversation most utterances can be seen as both initiative (for subsequent utterances) and response (to prior utterances). We think that this duality of utterances can be brought to other types of actions as well. The husband's acts of chopping and delivering firewood can be seen as a *response* to the request of the wife. These material actions can also be seen as an *initiative* for the wife's actions of making a fire.

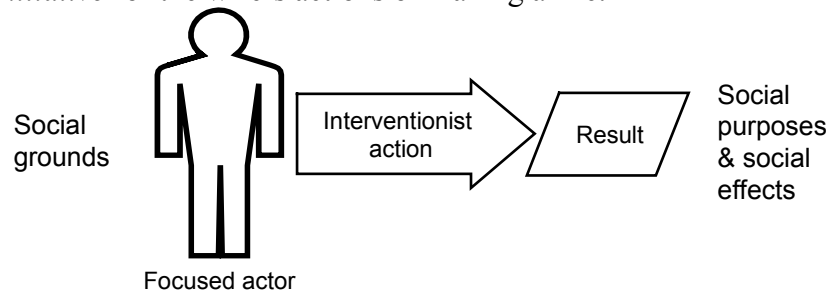


Figure 1 A simple illustration of social action

The husband transforms wood to firewood through chopping. He uses an axe as a tool for this. The axe is an instrument that mediates his action, i.e. the axe enables, directs and restricts his chopping actions. The wood to be chopped is the base for his actions. The base (wood) will be transformed into result (firewood) through his chopping. This distinction between base and instrument is important. An action base is *transformed* to action result, while an instrument is *utilised* in and for action.

In this example it is obvious that the request is a result of human action (the wife's uttering). It is however important to see that the axe and the wood also are products of human behaviour. The wood has been sawn and piled by someone who we conceptually will label as a *base provider*. The axe is produced by someone, who we will call an *instrument provider*. There exist action relations between these providers and the focused actor transforming the base and utilising the instrument. We would like to emphasize this since it is not explicitly acknowledged in the activity theory model. These are important aspects of the sociality of the social action. The material grounds of a social action are usually also social since the base and the instrument are produced by some other persons. This is illustrated in a refined model of social action, which is found in figure 2.

The results of the actions of the husband are chopped firewood that he brings to his wife. His purposes are social. He directs his actions towards another person. He produces and delivers something to another person. He does so in order to fulfil a request from his wife, who is both an *initiator* (through her request) and a *recipient* of the husband's actions. The wife can use the firewood as base for her *succedent actions* of making a fire in the fireplace. Figure 2 describes the social action in a principle way with these relating roles, objects and actions. It emphasises that the grounds for action are social and the purposes of the action are social.

Let us now return to the important issues brought in from business process and activity theories mentioned above. How do these issues appear in an explicit socio-pragmatic light?

We just briefly recapitulate the important categories: Customers; (horizontal) transformation; negotiation, agreement and commitment; vertical and horizontal governance; mediating tools.

The customers are the recipients of the produced action objects, and as such one should explicitly recognise them. The customers (recipients) may use the action result in their succedent actions. Transformation means that actors through refinement actions change the base into action result. The aspects of negotiation, agreement and commitment are expressed through the communicative initiative towards the focused actor. The acceptance of a request must many times be negotiated in order to have agreements and commitments established. Vertical and horizontal governance is concerned with different forms of initiatives (assignments) and we will go deeper into this below. Tools are mediating actions, but it is also important to recognise that such instruments are socially constructed and produced.

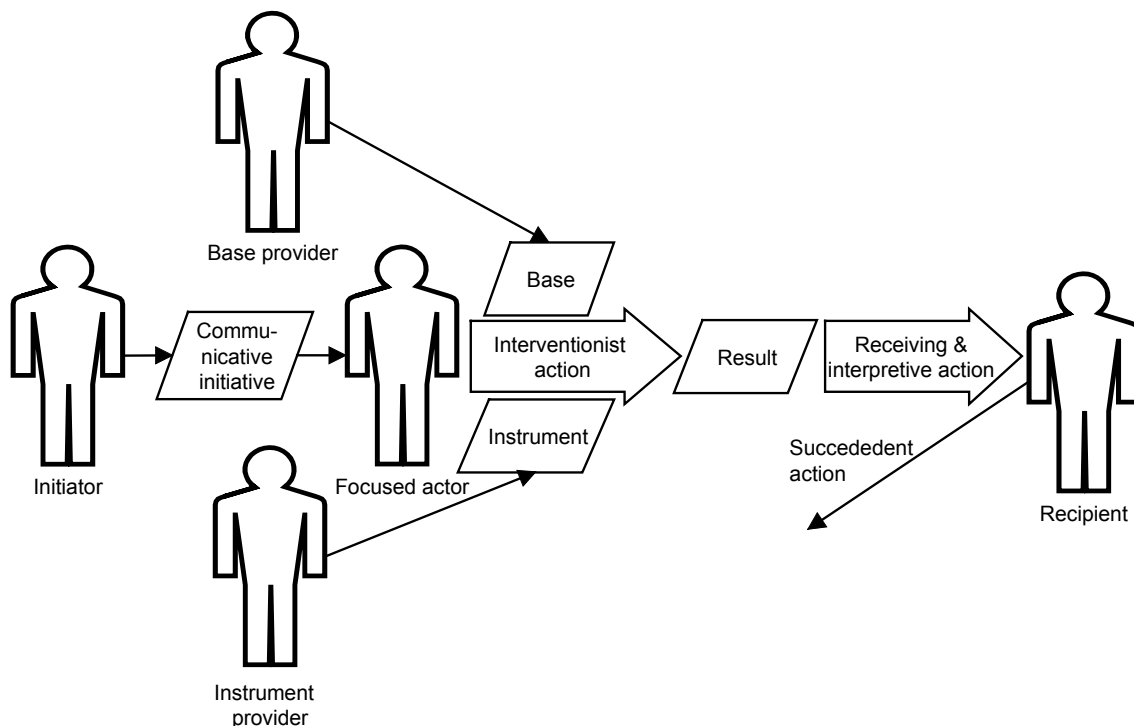


Figure 2 A refined model of social action

The socio-pragmatic view¹ on actions is also a multi-functional view on actions. A social action is often at the same time:

- A response to an initiative
- A fulfilment of a commitment
- An utilisation of an instrument
- A transformation of a base
- A production of a result
- A realisation of intentions
- An accomplishment of effects
- Directed towards one or several other persons
- An initiative/basis for succedent action

¹ This view, which sometimes more precisely is called socio-instrumental pragmatism, has been described elsewhere; e.g. Goldkuhl (2001) and Goldkuhl & Röstlinger (2002a).

This is not a comprehensive list of action functions; there are other important aspects also (like e.g. that actions are knowledgeable, attentive, reflexive, accountable). The list is simply derived from figure 2 and the discussion above.

2.5 Workpractices

We performed above an analysis of possible CA ontologies and identified important aspects within them and subsequently we reformulated these aspects in socio-pragmatic terms. Based on these steps we will now try to articulate a socio-pragmatic view on workpractices as a possible CA ontology.

A social action context (as it is described in figure 2) will be a basic building block in this ontology. But what will be studied within a CA are not randomly scattered social actions. It will rather be social actions organised in a meaningful way. Such a social action organisation will be called a practice. A practice is web of actions; social actions that are related and combined in a meaningful way. There is a growing attention in social science towards the concept of a practice; cf e.g. Giddens (1984), Schatzki (1996), Scollon (2001). Schatzki et al (2001) speak about a 'practice turn in contemporary theory'. What we will present below is in the spirit of this practice turn.

A practice is "holistic" notion in relation the "atomistic" character of action. A practice is a wholeness consisting of combined and related actions. A practice is considered to be "embodied, materially mediated arrays of human activity centrally organized around shared practical understanding" (Schatzki, 2001 p 2). Human actions are performed within a practice and determined by the practice which they are part of. This means that a practice determines which actions are adequate within that practice; i.e. what actions count as enactments of the practice.

Many of the above mentioned scholars talk about practices in broad and general terms. We delimit ourselves to a specific form of practices, to *workpractices*. By this we mean a practice (i.e. a meaningful complex of related actions) producing results in favour of customers. There are some people - the customers - who demand the products created from the workpractice. This makes a distinction between the customers (the recipients) and the producers of the workpractice. The apparent concept of customer is used in several of the approaches mentioned above. Our aim is to have a generic concept of workpractice, which implies a challenge of the genericness of the customer concept in this respect. A customer usually means a buyer. This is the case in ordinary commercial settings. But we want to go beyond this and also include non-commercial settings in our workpractice notion. Because of this we replace the customer concept with "client". A customer is a special case of client, appearing in commercial settings.

We now have two roles related to our workpractice notion; producers and clients. Following the socio-pragmatic model (figure 2) there should be more roles and action objects. The workpractice must have certain preconditions. There must be a base to be transformed into products (results). There need to be instruments guiding and mediating the production. There must also be a communicative initiative for the production. This means that there must be someone who asks for the work to be done and based on this a created agreement on that work to be done. This is fully in line with the statement by Schatzki (2001 p 5): "Practice thinkers usually acknowledge the structuring and coordination import of agreements, negotiations, and other interactions". This is also fully in line with the LAP approaches to

coordination in business processes described above (sec 2.2). There was however a criticism towards such approaches for only viewing the horizontal dimension. There are not only persons ordering products (usually the clients/customers). There are also assignments made by people (“management”) within the workpractice directed towards the operative producers. Hence, there may often be different (vertical as well as horizontal) initiatives directed towards those who perform the productive actions within a workpractice. We chose to use the concept of assignment (instead of initiative) for these different types orders and requests. In the socio-pragmatic model above we talked about initiators. In the workpractice model we talk instead of assigners; and assigners can both be outside of the workpractice and within it.

We include also some more action objects and roles in our generic workpractice model. As Barnes (2001 p 21) emphasises, an enactment of a practice is a “knowledgeable, informed and goal-directed enactment”. The assignments (as described above) represent certain goals for the workpractice. We claim that there may be other more general normative elements having a governing force for practices. There will be different norms with prescriptions for the quality actions and products. The producers must, as said above, be informed and knowledgeable. This includes for example knowledge about assignments, but there are also knowledge requirements for procedures and also of other general kinds.

Since we are dealing with workpractices, there are of course economic aspects, which must be recognised. To exist and survive workpractices usually need financial capital.

These different aspects are put together in a generic model for workpractices (figure 3).

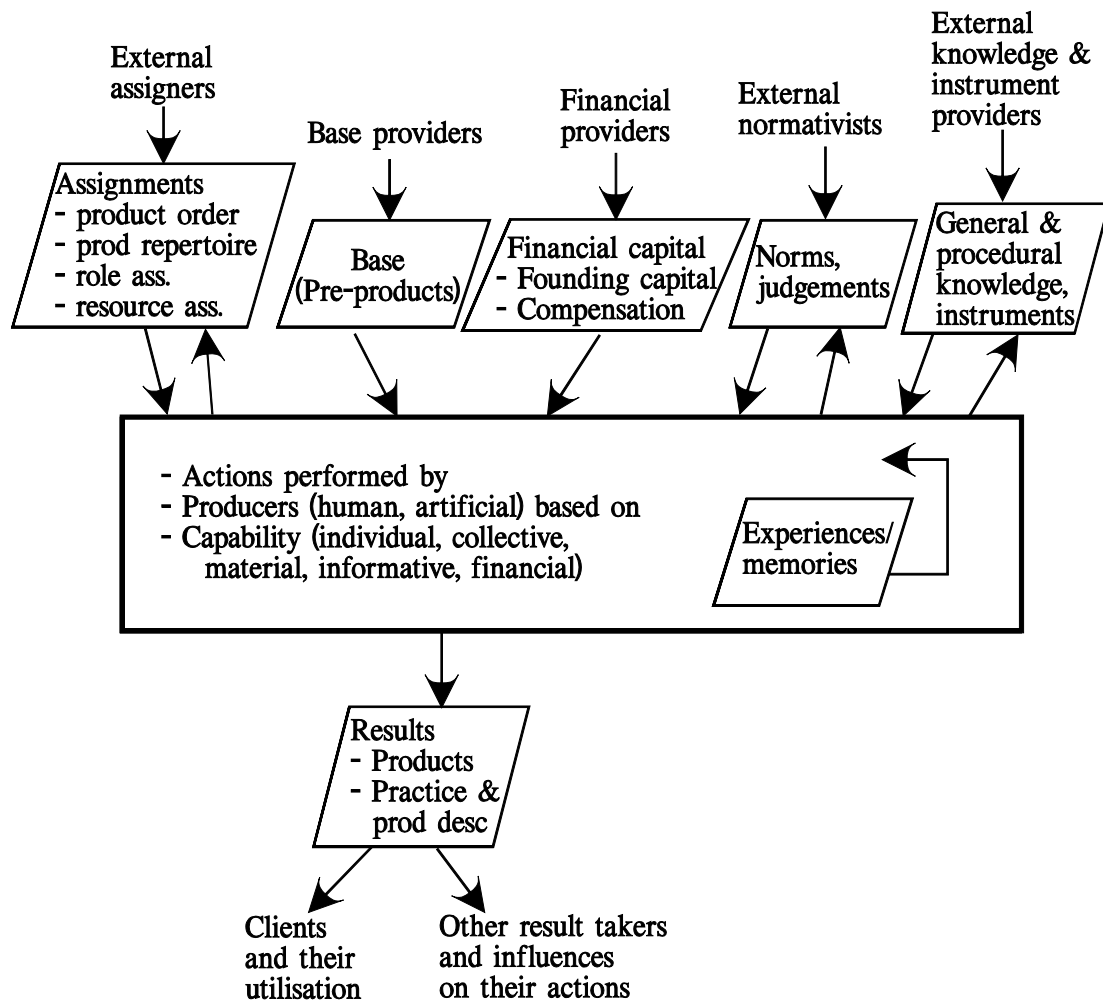


Figure 3 A generic model of workpractices (from Goldkuhl & Röstlinger, 2002b)

It is a contextualized and relational description. It describes principal actions within and outside the workpractice and the actors. Important preconditions for a workpractice are mentioned and also the actors creating these preconditional action objects. This is done in order to explicitly show socio-pragmatic character of the grounds for the workpractice. Confer the discussion in sec 2.4 above.

We have just sketched this workpractice model here. There is a need to give a comprehensive account of the model. It is however beyond the purpose and scope of this paper to give such a comprehensive description. It can be found elsewhere (Goldkuhl & Röstlinger, 1999, 2002a, b). We have presented this model and view of workpractices here as a proposed candidate for a change analysis ontology. We have above tried to elaborate on its socio-pragmatic foundations. In an example of a change analysis below (sec 4) we will describe the utilisation of this workpractice ontology.

3 How to perform change analysis?

Change analysis is an organisational problem solving process. Describing it as a problem solving process does not mean that all problems will be or can be solved during this process. First, CA is a process of defining problems and proposing solutions. This will not automatically lead to problem resolution. Change measures must be developed and

implemented. Second, not all problems might be possible to eliminate. There are situations, which you must keep up with. You can hopefully reduce the problems, but not eliminate them. Change analysis is an endeavour for problem reduction and resolution.

CA/SIMM, as a second-generation approach to change analysis, was described (above in sec 1) consisting of five areas. These areas were put together in a method structure (figure 4). There is a principal order described in this problem solving process: From problems via change requirements to change measures. The concept of change requirement is important. It introduces a step and concept between problem and measure. A problem is something unsatisfactory and a measure is a way to reduce or eliminate the problem. A change requirement is a statement of something to be changed and in what direction. It is not a statement of a concrete measure to take. Formulating change requirements gives opportunities for alternative measures. It gives frames for creating different change proposals.

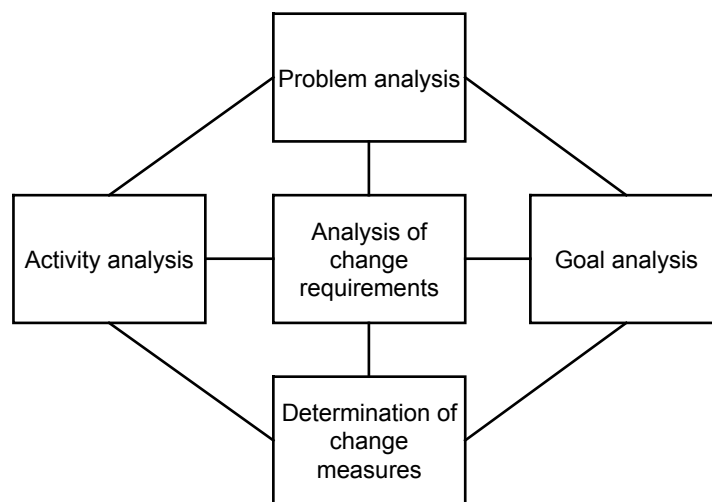


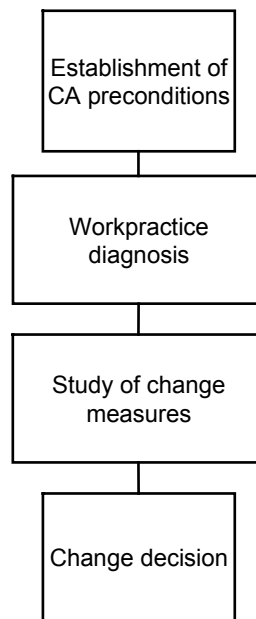
Figure 4 Method structure of CA/SIMM – second-generation of change analysis (from Goldkuhl & Röstlinger, 1993).

This method structure emphasises certain aspects of the problem solving process; the gradual shift from problem to change requirement and further on to change measure. There are other problem solving aspects, which are not made explicit. There are important resolutions made during change analysis. Before working with change measures there should be an *evaluation* of the current situation made. This means that one should perform a *diagnosis* before certain remedies are formulated. The change analysis should not be ended before a *decision* is made on what changes to realize. These aspects have been emphasised in an alternative CA/SIMM method structure (figure 5).

There is another important problem with the original CA/SIMM method structure (figure 4). There are other aspects, which might be focused in CA, which are disregarded in this method structure. There is an emphasis on problems. The study of strengths in the organisational setting is not acknowledged in the method structure¹. There might be other aspects as well to study, which are not covered by the method structure. It is a fixed, rigid structure. Change analysis is an initial step in an organisational change process, and there might be needs for studying many different aspects, which are difficult to anticipate in a fixed method structure.

¹ Röstlinger (1993) made a proposal to add strength analysis to CA/SIMM – and so has been done.

This has also led us to make a rearrangement of the earlier method structure of CA/SIMM (figure 4). An alternative method structure is found in figure 5.



*Figure 5 A refined method structure of change analysis
(new CA/SIMM method structure)*

In this new method structure, change analysis consists of two main areas: A workpractice diagnosis and a study of change measures. There is also an explicit starting point of CA in terms of “establishment of CA preconditions” and an explicit end point in terms of a “change decision”. The method structure of workpractice diagnosis has been magnified in figure 6. Workpractice diagnosis is here divided into two areas: 1) workpractice inquiry where different aspects of the workpractice is investigated and 2) condensed evaluation where the inquiry is summarised and evaluative conclusions are made in terms of change requirements.

Workpractice inquiry consists of different focal areas. A *focal area* means that certain aspects are focused in that investigation, e.g. there is a focal area of problem analysis where problems are studied. In the method structure of workpractice inquiry we have avoided the rigid structure of figure 4. The method content in figure 6 (i.e. the mentioned focal areas) is to be seen as one possible assembly of focal areas. In the figure there are three dots after communication analysis. This means that other areas might be added in accordance with specific inquiry needs. The mentioned focal areas are not to be seen as mandatory to perform, although we have mentioned some of the most important focal areas. The order is not either fixed. The focal areas are to be seen as an assembly of areas. No definitive order is expressed in the method structure of figure 6. It should be possible to switch back and forth between different focal areas in an alternating and iterative way.

In the earlier method structure of CA/SIMM (figure 4) it was hard to add new areas. This delimitation is now avoided. New areas can easily be added and withdrawn from the content of workpractice inquiry.

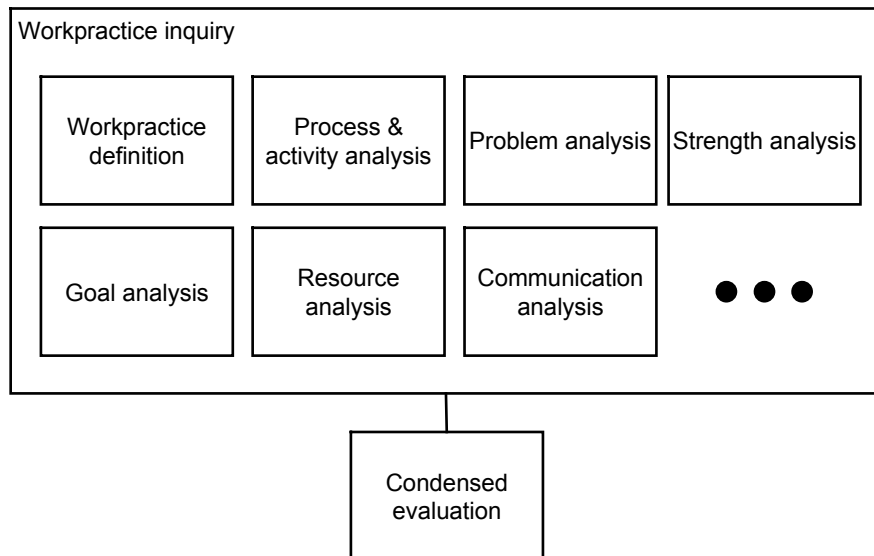


Figure 6 Method structure of workpractice diagnosis (part of CA/SIMM)

4 Workpractice diagnosis – an empirical illustration

We present here parts of a workpractice diagnosis as an illustration. This example serves as an illustration of the workpractice ontology described in section 2.5 above as well as of the method described in section 3. The example is from home care service for elderly persons. The focus is on problems around using an alarm system for emergency service for elders in their own residences. The example is based on a performed real change analysis. We have however cultivated the example for purposes described above. The example should thus not be read as an empirical validation of the efficiency of the CA method.

Certain parts of workpractice diagnosis are illustrated below. We start with a workpractice definition. Three sub definitions are shown below (figure 7-9)¹. This change analysis were initiated mainly because of problems of obtaining the goals of giving emergency service to elders within 20 minutes after the alarm was given. This goal was stated in the contract with the elders.

An alarm equipment is installed in the residence of the elder. An alarm button is carried by the elder. The elder presses the button when emergency help is needed. A home care assistant should come within 20 minutes for attendance. Before the home care assistant comes, the elder can discuss the situation over the phone with a receptionist. In figure 8, the assignment logic is described. Product order from the elder can be seen to exist on two levels. First there must be a contract between the elder and the elder care service unit about emergency service. Based on this frame contract an alarm system will be installed. This is a prerequisite product, which is necessary for the main product of emergency service (cf fig 7 about these two products). Every time the elder presses the alarm button an order is given to the elder care unit for emergency service. The alarm functions as a suborder in accordance with the frame contract. The work of the elder care personnel (home care assistants and receptionists) is mainly governed by these assignments of product order character. There are, however, also

¹ These workpractice definitions are not complete. We have left out certain parts, which are not necessary to show here for our illustration purposes.

other assignments which govern their work; as role assignments in the form of job and routine descriptions.

Base & base provider	Elder in his/her residence with needs of emergency character
Producer	Receptionist (receiving alarms=product orders) Home care assistant (performance/delivery of demanded service)
Product	1. Alarm equipment 2. Help and support in the residence within 20 minutes after alarming
Product character	1. Prerequisite product: Temporarily provided information transfer equipment 2. Main product: Treatment of client (physical, emotional and informational needs)
Client	Elder in his/her own residence receiving care
Effects	Remedies for elders in emergency situations with the purpose to feel secure and be able to remain living in own residence

Figure 7 Transformation in the elder care emergency service workpractice

Product order	1. Frame order about emergency service. This means that alarm requests (see product order # 2) can be given at any time and with no frequency restriction (through the alarm equipment). 2. Request for help and support through alarm equipment (pressing the alarm button) in emergency situations. 2A. Request specified in subsequent telephone call with receptionist. 2B. Request specified to home care assistant when she has arrived to the residence.
Product orderer	Elder
Role assignment	Job descriptions and routine descriptions.
Role assigner	Elder care administration; director for elder care service unit

Figure 8 Assignments in the elder care emergency service workpractice

The alarm system is a main instrument for this emergency service. There is an alarm equipment in the residence of the elder which is connected to the PC-based alarm system at the reception and to an alarm box which is worn by the home care assistant who is on emergency on-call duty. This is described in the sub definition of figure 9. In this definition certain types of knowledge preconditions are also described.

The process of emergency service is described more fully in two related action diagrams¹ (figure 10-11). These diagrams (as part of the focal area process & activity analysis) describe the process and different actions within it. Performers of actions (humans and/or artefacts) are described, and sometimes also the place(s) of action. Different action objects (informational or material) are related to the actions as preconditions (input) or result (output). Action logic is described in terms of action order, alternatives, conjunctions, parallelism, conditions and triggers.

¹ We have used action diagrams, which is a notation within the CA/SIMM method (Goldkuhl, 1992; 1996). Some minor modifications of the notation have been made.

Norms	<ol style="list-style-type: none"> 1. Social welfare law 2. Documented quality criteria 3. Orally and informally transferred normative reflections
Framers of norms	<ol style="list-style-type: none"> 1. The government 2. Elder care administration 3. Elder care service unit (director and personnel)
Instruments	<ol style="list-style-type: none"> 1A. Alarm equipment (at the residence of the elder) 1B. Alarm IT-system 1C. Alarm box (worn by the home care assistant) 2. Keys to elders' residences 3. Telephones
Instrument provider	<ol style="list-style-type: none"> 1. Alarm system supplier 2. Elders
Knowledge	<ol style="list-style-type: none"> 1. General knowledge about elder care service [receptionists, home care assistants]. 2. Knowledge about particular elders; their needs and alarm behaviour [receptionists, home care assistants]. 3. Knowledge about alarm system [receptionists].
Knowledge providers	<ol style="list-style-type: none"> 1. Elder home care personnel (colleagues), teachers, researchers 2. Elders, elder home care personnel (colleagues) 3. Alarm system supplier
Knowledge means (of permanence)	<ol style="list-style-type: none"> 1. Books, journals 2. Journal notes 3. Alarm system, manuals
Knowledge provision situations	<ol style="list-style-type: none"> 1. Learning through own experiences, discussions, attending to courses, reading 2. Learning through own experiences, discussions, reading 3. Learning through own experiences, reading
Memories	<ol style="list-style-type: none"> 1. Registered alarm situations (in alarm IT-system) 2. Key list 3. Journal notes

Figure 9 Knowledge and instruments in the elder care emergency service workpractice

The description (fig 10) starts with an elder alarming, i.e. presses the alarm button. The alarm system transfers this alarm to a signal (and display of a residence id) at the alarm box worn by the home care assistant who has emergency duty. At the same time there is an alarm signal in the PC at the reception and also a ring in the telephone by the elder's residence. The emergency order of the elder is in these ways technically transferred to the elder care unit. The receptionist answers the phone and speaks to the elder if he has been able to pick up the phone. In such a case they can discuss the urgency of the call. Many times the receptionist can sort out the need by telephone and there is no need for a visit to the elder.

When the home care assistant receives the alarm signal she has usually no possibilities to communicate with either the elder or the receptionist. She hurries to the reception, if she is not occupied with some other urgent matter. When she comes to the reception, she will be informed by the receptionist about the alarm situation. They can discuss possible measures to take. As said above, sometimes there is no need for a visit to the elder. If this was the case, the assistant may return to other duties. If a visit is necessary, the home care assistant gets a key from the receptionist and leaves for a walk to the elder in order to attend to the needs. After attending to the elder, the assistant returns to the reception and hands over the key to the receptionist. This will close an instance of the emergency service process.

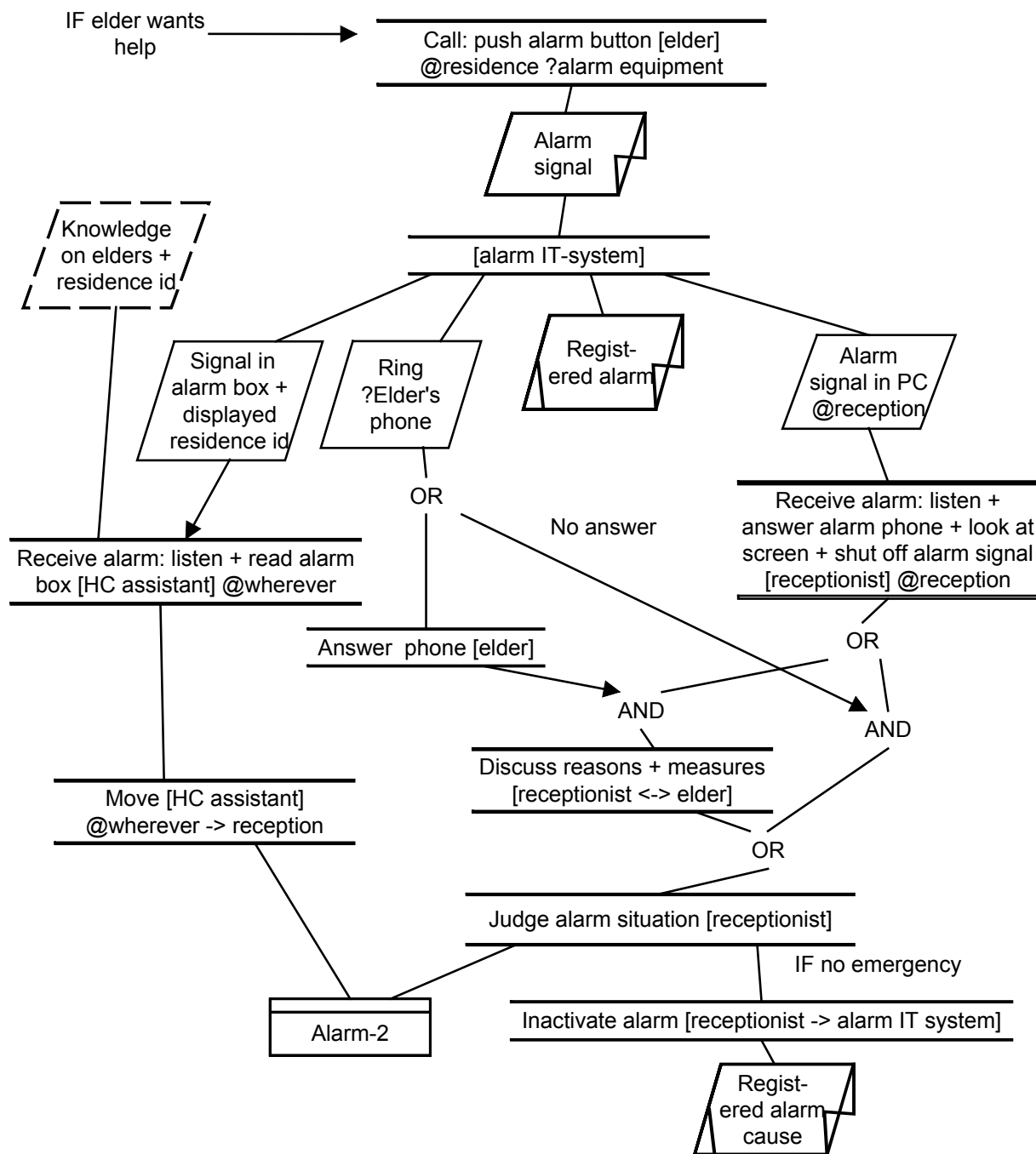


Figure 10 Action diagram Alarm-1

As indicated above, there are certain problems in the workpractice. Some of the problems have been analysed and described in a problem diagram¹ (figure 12). We have used problem analysis and problem diagrams according to CA/SIMM (Goldkuhl & Röstlinger, 1993). In problem diagrams an analysis of problem causes and problem effects are documented.

¹ We have used problem analysis and problem diagrams according to CA/SIMM (Goldkuhl & Röstlinger, 1993).

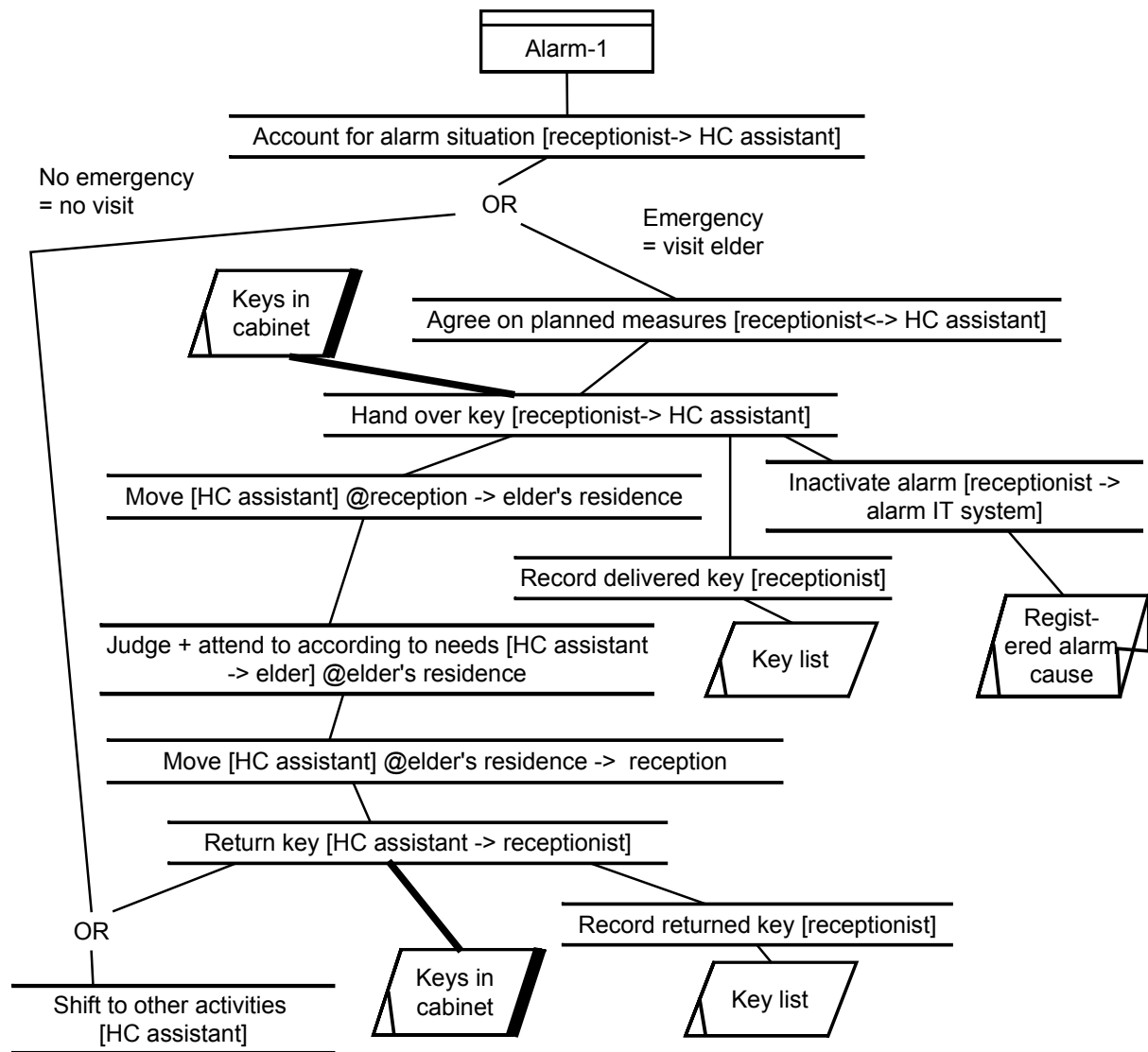


Figure 11 Action diagram Alarm-2

The performed problem analysis has revealed some major problems. The intention behind the alarm system (and this kind of elder care product) is to help the elders in emergency situations. The elders utilise the alarm for other purposes as well. They have information needs and contact needs, which can be resolved by using the alarm system. When an elder has pressed the alarm button he can speak in telephone to the receptionist at the elder care unit. The receptionist has asked the elders not to use the alarm in non-emergency situations. They should use the phone instead. But it is so easy for the elder to use the alarm, because the alarm button is worn round the wrist. And it is not always easy for an elder to distinguish between an emergency and a non-emergency situation. Many alarms are thus not real alarms. One can rather call them “false” alarms.

The emergency service process is organised for emergency service. The home care assistant who is on emergency on-call duty hurries after receiving the alarm signal to the reception to get information and the residence key. Many times this hurried transportation was not necessary. The analysis of the emergency service process and its problems has shown important causes why the home care assistant fails to be in due time after alarm. It has shown

that alarm artefacts are used for other purposes and this “misuse” has distortive effects on the process.

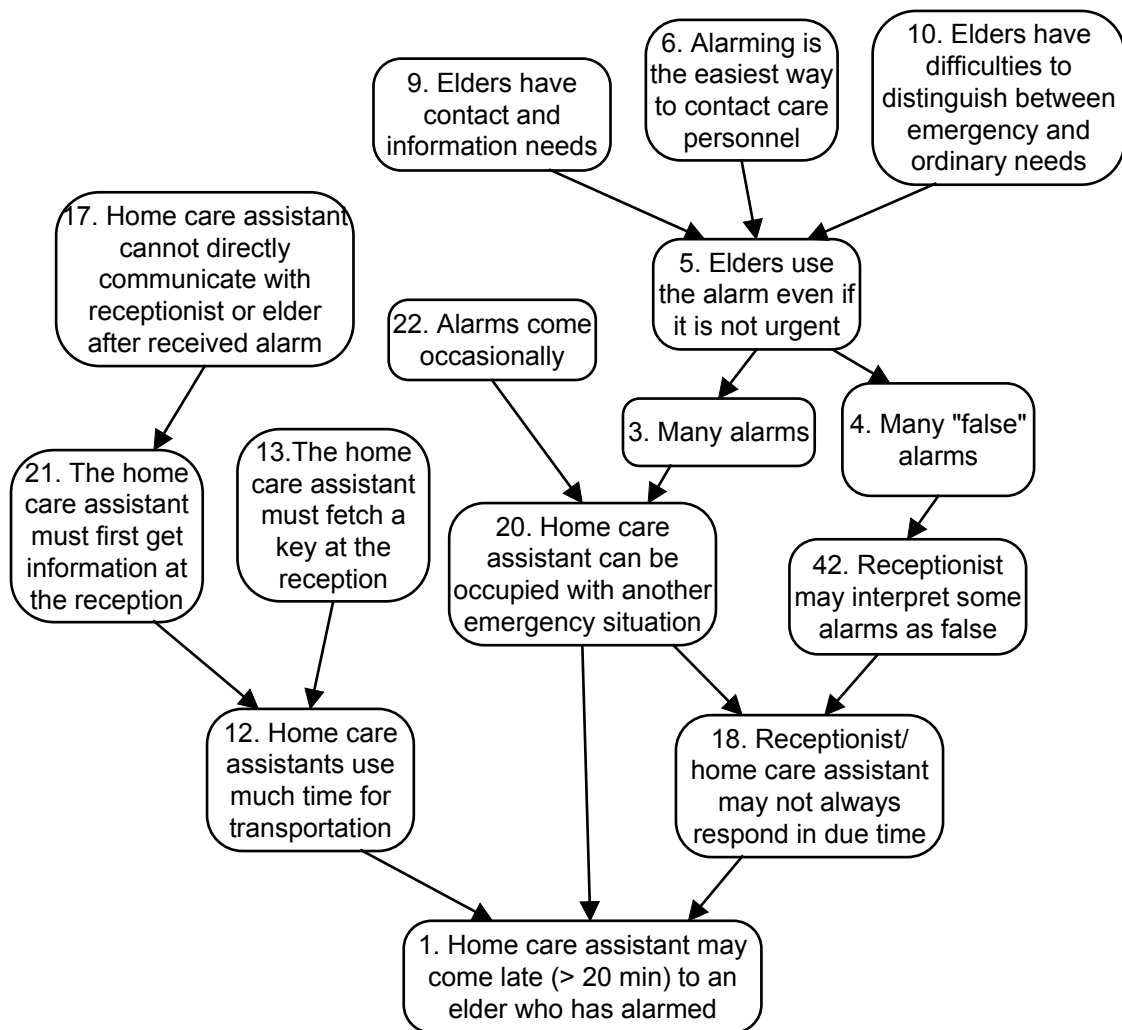


Figure 12 Problem diagram

When performing the workpractice diagnosis, gradually more and deeper understanding was obtained of the elder care service unit. An understanding emerged of the basic principles of the workpractice, the problems, the strengths, the goals and the workflow. The performed analysis of problems, causes and effects has pointed to a need for changes in the workpractice, a need for reducing problems. But what are the change requirements? To create change requirements is a step towards measures and problem solutions, but a change requirement does not state how to change but what problems to be transform to non-problems. A change requirement states a direction of change, and thus gives frames for a change without specifying how to change. The exact “how to change” is expressed in the following change measures. As seen below change requirements are often expressed by attributes of “increased”, “decreased”, “better”, “more” “less” etc.

For the elder care service unit there are several interesting change requirements as e.g.:

- Reduce the transportation time for the home care assistants.
- Reduce the amount of “false” alarms.

- Increase the possibility of communicating, for the home care assistants to reach and to be reached e.g. by phone.
- Adaptation of the care service to the elder's real needs of service, develop the alarm product to include several sub-products.
- Better use of the receptionist as a service provider to the elders
- Decrease the delays in emergency service to the elders. This requirement is related to the main goal of the elder care service unit, which is also a product goal "Help and support in the residence within 20 minutes after alarming".

The alarm product means that elders have got an instrument (alarm equipment) to help them put sub orders whenever they want to. The instrument is so useful and easy to handle that the clients use it too much and for other purposes as well. This is usually an entirely positive aspect of a product. In this case it affords different forms of communication behaviour, but this renders problems to the organisation and its provision of services. The elder care unit is not organised and dimensioned for this overconsumption of the alarm product. The high demand and not planned consumption bring problems to the organisation and consequentially also to the clients. The producer cannot always deliver care service according to agreement. The clients' behaviour is one cause to the problematic situation. But the solution is not so simple because the behaviour of the clients is hard to influence. Are there other important aspects revealed in the change analysis of the workpractice? One positive aspect of the workpractice (a strength) is the receptionist as a central staff member maintaining close contacts with the elders and gathering knowledge about them and their needs. The receptionist is good at prioritizing and taking care of problems by discussing with clients on the phone. This has positive effects on the workpractice. And by increasing this task the receptionist can do an even better work as a service provider to the elders. The alarm product can be developed into sub-products, e.g. service at residence by home care assistant and service on phone by receptionist. This means an adaptation to the situation of demands, and thus none of the alarms can be seen as "false" alarms but all alarms are correct given product orders from clients. In the current situation, the IT-system transforms the pressed alarm button (as a product order) from client to an alarm signal received both by the receptionist and the home care assistant on-call duty. This can cause some uncertainty, as the home care assistant does not really know if she has to go to the client or not. If she has the possibility to communicate with the receptionist she can get a more specified order from the well-informed receptionist. Improved communication as well as a phone service product will reduce the need of transportation for the home care assistants. Transportation will not be a constituent element in all service production. It will be a necessary element in helping at home, but not in telephone service provided by the receptionist. All together these change requirements also will decrease the delays in emergency service to the elders in a way that the commitment "Help and support in the residence within 20 minutes after alarming" can be fulfilled.

5 Conclusions: Towards a combined socio-pragmatic ontology and epistemology of change analysis

We have in this paper taken steps towards a combined socio-pragmatic ontology and epistemology of change analysis. The concept of change analysis is important, since it emphasises that we should not take IT development, or other solutions as well, for granted in organisational problem solving. We should pursue an unbiased investigation on the organisational situation at hand. Based on this view of change analysis, we have here taken one step further to elaborate on a socio-pragmatic ground for change analysis. This socio-pragmatic ground is a base both for ontological and epistemological issues.

Change analysis ontology concerns what we study during this inquiry process. The message in this paper is that we study “socio-pragmatic matter” in a CA process. We study a web of social actions. Such actions are governed and mediated by communicative initiatives (assignments), material and immaterial bases and instruments. The web of actions is constituting the workpractice which it is part of. The social actions are performed in a knowledgeable and normative context. The actions are social since they are based on other social actions and directed towards other persons. The essence of a workpractice is that it should create products in favour of its clients.

Change analysis epistemology concerns knowledge issues – what kind of knowledge is obtained and how it is obtained. One important part of CA knowledge is diagnostic knowledge. A diagnosis is made in order to improve the workpractice. This means that we must establish a sufficiently deep understanding of the workpractice in order to state remedies for its improvements. A diagnosis is driven by an interest to understand. Integrated with this interest to understand is an interest to change and improve. In order to make diagnostic statements about a workpractice there is (besides a sufficiently deep understanding about the performance of the workpractice) a need to know:

- What is problematic in the workpractice (potentials for change)
- What is well functioning in the workpractice (potentials for non-change)
- What is desired in the workpractice (directions for change)

A workpractice diagnosis involves such grounded knowledge and also evaluative conclusions (in terms of stated change requirements) based on such knowledge. This grounded workpractice diagnosis should inform change decisions which are also part of change analysis.

The socio-pragmatic perspective emphasises a shared understanding about these issues. A shared understanding may arise when people work together through inquiries and discourses. Since workpractices are complex and workpractice diagnoses are complex endeavours it is necessary that such discourses involve documentation. The shared understanding should be expressed in descriptions with enduring existence. People should be able to inspect and reflect on what has been discovered and concluded earlier in a change analysis. Modelling techniques have a mediating force during CA while directing attention to aspects, which should be important to investigate. We have in this paper shown some possible models to be used in a change analysis (workpractice definition, action diagram, problem diagram).

The theory and method development presented in this paper is a basis for utilisation and further research. A continued research in this direction should include elaboration of different

method components and their inter-relations and also more empirical work concerning method application.

References

- Austin JL (1962) *How to do things with words*, Oxford University press.
- Barnes B (2001) Practice as collective action, in Schatzki et al (2001)
- Born G (1994) *Process management to quality improvement*, John Wiley, Chichester
- Checkland P (1981) *Systems thinking, Systems practice*, John Wiley, Chichester
- Davenport TH (1993) *Process innovation. Reengineering work through information technology*, Harvard Business School Press, Boston
- Davenport TH, Short JE (1990) The new industrial engineering: Information technology and Business Process Redesign, *Sloan Management Review*, Summer 1990, p 11-27
- Dietz JLG (1999) Understanding and Modelling Business Processes with DEMO, *Proc. 18th International Conference on Conceptual Modeling (ER'99)*, Paris
- Engeström Y (1991) Developmental work research: Reconstructing expertise through expansive learning, in Nurminen M, Järvinen P, Weir G (Eds, 1991) *Proceedings of human jobs and Computer interfaces Conference*, University of Tampere
- Engeström Y (1993) Developmental studies of work as a testbench of activity theory: The case of primary care medical practice, in Chaiklin S, Lave J (Eds, 1993) *Understanding practice. Perspectives on activity and context*, Cambridge University Press
- Engeström Y, Miettinen (1999) Introduction, in Engeström et al (1999)
- Engeström Y, Miettinen R, Punamäki R-L (Eds, 1999) *Perspectives on activity theory*, Cambridge University Press
- Giddens A (1984) *The constitution of society. Outline of the theory of structuration*, Polity Press, Cambridge
- Goldkuhl G (1992) Contextual activity modelling of information systems, in *Proceedings of the 3rd International Working Conference on Dynamic Modelling of information systems*, Noordwijkerhout
- Goldkuhl G (1996) Generic business frameworks and action modelling, In *Proceedings of conference Communication modelling - Language/Action Perspective '96*, Springer Verlag
- Goldkuhl G (2001) Communicative vs material actions: Instrumentality, sociality and comprehensibility, in Schoop M, Taylor J (Eds, 2001) *Proceedings of the 6th Int Workshop on the Language Action Perspective (LAP2001)*, RWTH, Aachen
- Goldkuhl G, Röstlinger A (1984) The legitimacy of information systems development - a need for change analysis, in *Proceedings of IFIP Conference Human-Computer Interaction*, London
- Goldkuhl G, Röstlinger A (1988) *Förändringsanalys - Arbetsmetodik och förhållningssätt för goda förändringsbeslut* [in Swedish], Studentlitteratur, Lund
- Goldkuhl G, Röstlinger A (1993) Joint elicitation of problems: An important aspect of change analysis, in Avison D et al (Eds, 1993) *Human, organizational and social dimensions of Information systems development*, North-Holland
- Goldkuhl G, Röstlinger A (1999) Expanding the scope: From language action to generic practice, in *Proceedings of the 4th Int Workshop on the Language Action Perspective (LAP99)*, Jönköping International Business School
- Goldkuhl G, Röstlinger A (2002a) Towards an integral understanding of organisations and information systems: Convergence of three theories, in *Proc of the 5th International Workshop on Organisational Semiotics*, Delft
- Goldkuhl G, Röstlinger A (2002b) The practices of knowledge – investigating functions and sources, in *Proc of the 3rd European Conference on Knowledge Management (3ECKM)*, Dublin
- Gummesson E (1999) *Total relationship marketing. Rethinking marketing management: From 4Ps to 30 Rs*, Butterworth-Heinemann, Oxford

- Grönroos C (1990) *Service marketing and management. Managing the moments of truths in service marketing*, Lexington Books, Lexington
- Habermas J (1984) *The theory of communicative action 1. Reason and the rationalization of society*, Polity Press, Cambridge
- Habermas J (1998) *On the pragmatics of communication*, MIT Press, Cambridge
- Hammer M (1990) Reengineering work: Don't automate, obliterate, *Harvard Business Review*, p 104-112
- Hammer M, Champy J (1993) *Reengineering the corporation. A manifesto for business revolution*, Nicholas Brealey, London
- Harrington HJ (1991) *Business process improvement. The breakthrough strategy for total quality, productivity and competitiveness*, McGraw-Hill, New York
- Keen PGW (1997) *The process edge*, Harvard Business School Press
- Leontiev AN (1978) *Activity, personality, and consciousness*, Prentice-Hall, Englewoods Cliffs
- Linell P (1998) *Approaching dialogue. Talk, interaction and contexts in dialogical perspectives*, John Benjamins Publ, Amsterdam
- Ljungberg J, Holm P (1996) Speech acts on trial, *Scandinavian Journal of information systems*, Vol 8, no 1
- Lundeberg M, Goldkuhl G, Nilsson A (1978) A systematic approach to information systems development - I. Introduction; - II. Problem and data oriented methodology, *Information Systems*, Vol 4, s1-12, 93-118
- Lundeberg M, Goldkuhl G, Nilsson A (1981) *Information systems development - A systematic approach*, Prentice-Hall, Englewood Cliffs
- Mead G H (1938) *Philosophy of the act*, The university of Chicago Press
- Medina-Mora R., Winograd T., Flores R., Flores F. (1992) The Action Workflow Approach to Workflow Management Technology, In: Turner J., Kraut R. (Eds.) *Proceedings of the Conference on Computer-Supported Cooperative Work, CSCW'92*, ACM Press, New York
- Nilsson J E, Törnqvist A (2001) The effects of ICT on communicative and decision-making rationalities in urban planning, *Conference "Cities of tomorrow"*, Göteborg
- Ould M A (1995) *Business processes. Modelling and analysis for re-engineering and improvement*, John Wiley, Chichester
- Röstlinger A (1993) *Styrkeanalys. Ett arbetssätt för att tillvarata positiva aspekter i verksamheter* [in Swedish], IDA, Linköping University
- Sacks H (1992) *Lectures on conversation*, Blackwell, Oxford
- Schatzki TR (2001) *Social practices. A Wittgensteinian approach to human activity and the social*, Cambridge University Press
- Schatzki TR (2001) Introduction: Practice theory, in Schatzki et al (2001)
- Schatzki TR, Knorr Cetina K, von Schatzki TR, Knorr Cetina K, von Savigny E (Eds, 2001) *The practice turn in contemporary theory*, Routledge, London
- Schutz A (1962) *Collected papers I*, Martinus Nijhoff, Haag
- Scollon R (2001) *Mediated discourse. The nexus of practice*, Routledge, London
- Searle J R (1969) *Speech acts. An essay in the philosophy of language*, Cambridge University Press, London
- Taylor J, Van Every E (2000) *The emergent organization. Communication at its site and surface*, Lawrence Erlbaum, London
- Törnqvist A (2001) The role of institutions in the management of planning conflicts – aspects of rationality and power, presented at *the Oxford Planning Theory Conference*
- Von Wright G H (1971) *Explanation and understanding*, Routledge & Kegan Paul, London
- Vygotsky LS (1962) *Thought and language*, MIT Press, Cambridge
- Weber M (1978) *Economy and society*, University of California Press, Berkeley

Winograd T, Flores F (1986) *Understanding computers and cognition: A new foundation for design*, Ablex, Norwood

Österle H (1995) *Business in the information age. Heading for new processes*, Springer, Berlin