Accepted to Beyond convergence: The 12th Biennial ITS Conference – ITS'98, 21-24/6-1998, Stockholm, Sweden n

SERVICE DEVELOPMENT AS ACTION AND COMMUNICATION – FROM PROCESS RECONSTRUCTION TO PROCESS REDESIGN

MIKAEL LIND

University of Borås
Department of Computer Science and Business Administration
S-501 90 Borås
Sweden

Telephone: +46 705 66 40 97
Email: Mikael.Lind@hb.se

GÖRAN GOLDKUHL

Linköping University
Centre for studies on humans, technology and organization (CMTO)
S-581 83 Linköping
Sweden

Telephone: +46 705 52 98 15
Email: ggo@ida.liu.se

ABSTRACT

Service development means refinements of ideas into services and redeveloping existing services. Such refinement must be supplemented with evaluation and decision processes. The paper describes the reconstruction and redesign of a service development process at ABB Infosystems.

1. INTRODUCTION

There is a strong imperative for firms to be highly market responsive in the today situation with intense and global competition. Current products must meet the expectations of customers. Future products must meet the expectation of tomorrow's customers. The firm must continuously work with development of new products and improvements of current products. Many marketed products consist of a customised mix of goods and services (Normann, 1991). Development of products (goods and services) is obviously a crucial task. The development of goods has a long history and is an established area. This is not the case with service development (Gummesson, 1991). Some knowledge exists, but there is great need for further development (ibid).

IT companies usually have a mixed supply of goods and services. Even if such companies sell goods they are often typical service companies in the sense of a strong customisation to customer needs and a high degree of customer specific services. There is a real challenge in such a company to establish an on-going service development process.

The authors of this paper has a great interest in process oriented development of enterprises and information systems. During the fall of 1996 we performed a case study at ABB Infosystems of Sweden. We participated as action researchers in a development project concerning the service development process of the company. We are using this case study in our paper to discuss and illustrate how such service development process can be improved. The paper should not be considered only as a case study description. Our purpose is to discuss and develop theoretical constructs; and when doing this we are using the ABB case.

We focus three related areas in our paper.

1. How to view service development
2. How to view processes
3. How to perform process modelling

1. There is an obvious need for an explicit life-cycle perspective on services in a service development process. Such a process must of course include refinement of services but there must be evaluation and explicit decision processes.

2. Business processes consist of sub processes of refinement and transformation character. But business processes consist also of giving and taking assignments. When discussing processes it is also important to go beyond a partitioning of such processes into sequential sub processes. There might be alternative ways to perform business and such alternatives must be reflected in process structures. A sequential partitioning must be supplemented with a partitioning into variant processes.

3. The development of processes (service development processes or other processes) can seldom be done as a clean slate exercise. Current processes must be reconstructed, understood and evaluated as a basis for redesign. Such reconstruction and redesign should be done with support of process modelling. To model processes can be done in several ways. Instead of prevailing top-down modelling we argue for a contextual approach.

We are applying an action-theoretic perspective on the issues treated in the paper (e.g. Searle, 1969; Goldkuhl, 1995; 1996).

2. THE ABB CASE

At ABB Infosystems there exists three different business processes that operatively handle services. These are the marketing/sales process, the delivery process and the service development process (SDP). ABB Infosystems offers a wide variety of different services – from business consultation to supervision of computer operations. The marketing/sales process consists of activities for marketing and salesment of services, the delivery process of activities for delivery of services. The SDP consists of activities for development of new services, continuous improvement of services, maintenance of existing services, and liquidation of services.

There exists a relationship between the SDP and other processes in the business (see Figure 1), where the handling of services is common among these processes. The different processes make great demands on each other in order to secure good quality in the result. The marketing/sales process demands that the service and the description is a support during the offering and ordering phases. The delivery process demands that the service and its description is a support during the fulfilment phase. In order for the SDP to work there is a need for a supply of experiences (from using services) and ideas for (further) development from the other business processes.

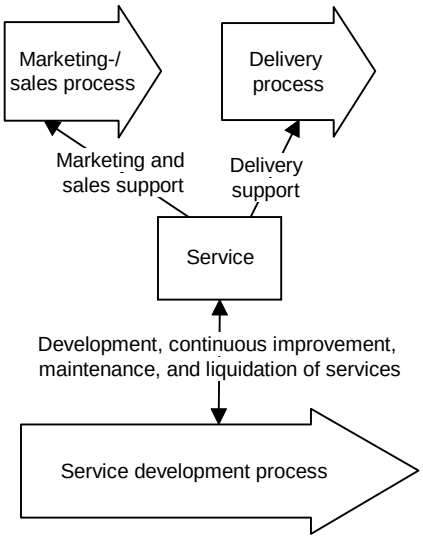


Figure 1: Business processes at ABB Infosystems

The purpose of the SDP is to ensure high quality in the services that are being offered. This is done through controlling the evolutionary development of services and supporting development of new services. Therefore there is a need that the SDP consist of procedures for continuous improvement of services as well as procedures for project based development of services.

In this research and development (R&D) project we started out in an existing description of the SDP, which consisted of five sub processes (see Figure 2). These were:

- *Evaluation*, which aims at generating, gathering and evaluating ideas for developing new and existing services.
- *Development*, which aims at developing an idea to a refined service.
- *Test*, which aims at testing the service at a pilot customer.
- *Maintenance*, which aims at gathering experiences from deliveries and desires concerning alterations or additions from customers that uses the services. Another purpose for this sub process is to look after that existing services are attractive and profitable.
- *Liquidation*, which aims at preparing, carrying out and evaluating the liquidation of a service

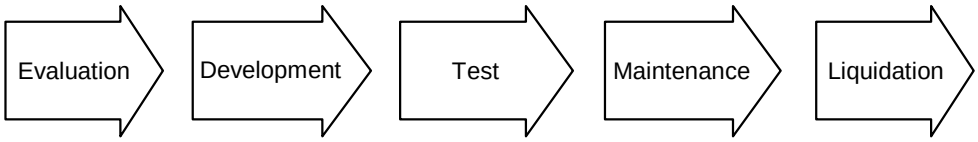


Figure 2: The sub processes of the existing SDP

The two of us conducted the R&D project together with two participants from ABB Infosystems. The two researchers are members of the network-based group VITS in Sweden. The co-operation procedure used in the project was work meetings with individual work conducted between each meeting. The R&D project has been performed on action research basis.

The R&D project was divided into two phases, reconstruction and redesign. We used the existing description of the SDP to perform process modelling, role analysis, goal analysis, and concept analysis in order to reconstruct the existing process. This was done to achieve a good understanding of the process between the members in the project group (participants from VITS and ABB Infosystems). This understanding together with the generated models of the SDP was then used as a base to evaluate and redesign the business process. During the redesign the notion of service was further articulated and developed. The process was

restructured based on the developed notion of service, goal models, and the evaluation of the existing description of the process. The redesigned process was described by using process models. During the R&D project a theory- and method driven (see Lind & Goldkuhl, 1997) reconstruction and redesign of the process was performed, i.e. the work was structured by the use of methods and focused by the aid of theories.

3. HOW TO VIEW SERVICE DEVELOPMENT

3.1 The service notion

To establish an appropriate service development process there is a need for an elaborated view on services. In the initial SDP at ABB there was an implicit life-cycle perspective on services. A service is created through a service development effort. A description of the service is made and used as a basis for marketing and delivery of the service. The service can be redesigned during its lifetime. Maintenance is thus performed on services. And finally the service can be liquidated and put away from the company's service mix. In ABB they deliberately used pilot installations as a means for developing the service. The service development process as a stepwise refinement of services is described in Figure 3. Here the life-cycle perspective is made more explicit.

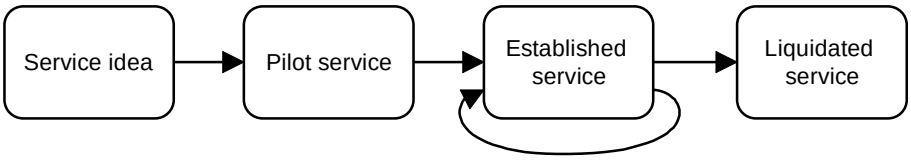


Figure 3: A life-cycle perspective on services

The life-cycle perspective was partially reflected in the initial SDP process of ABB. In the redesigned SDP (described in the next section) this life-cycle perspective has been more articulated and well reflected.

The service notion was discussed thoroughly during our reconstruction and redesign process. A division into different types of services was made. The notion of a *service concept* was introduced. A service concept was conceived to consist of several *service components*. Each service component in the total *service portfolio* was considered to be a possible part of several service concepts. A service concept needs to be "*packaged*" in order to be used in marketing and service production and delivery. Developing services will in the future consist of development of

- service concept
- service component
- packaging of service

3.2 The service development process

When the SDP at ABB was reconstructed there was confusion concerning existing perspective and procedures, which could be seen in models generated by the reconstruction. We had problems in understanding whether the labelling of the sub processes corresponded to their content. As an example one can mention that maintenance concerned following-up of services as well as continued refinement of services and components. The reason for this confusion was that the sub processes consisted of activities that concerned both refinement and evaluation, where some sub processes put more emphasis on refinement than evaluation and vice versa. The sub processes had several purposes. It is our belief that different parts of processes should have a clear delimitation, where one of the bases for achieving that is clear purposes. The unclear delimitation of the sub processes caused the interfaces between

different sub-processes to become unclear.

We also had problems in distinguishing the decision points in the SDP. This had its roots in that the contents of the sub processes concerning evaluation and refinement were mixed. Within the SDP there were also different kinds of refinement and different kinds of evaluation performed. These different kinds were revealed when looking upon the notion of services, both concerning service handling and the meaning of service within ABB Infosystems. Decisions concerning handling of these different variances were not made explicit enough.

When looking upon the sequential structure of the existing SDP it does not reveal the complexity of the service notion used at ABB. The SDP was described in a too simplified way. There was a need to ensure that the structure of the SDP was reflected in the way that services ought to be treated. The simplification of the SDP caused us to question the reason for the grouping made in the SDP.

These problems in the existing SDP were identified when creating detailed process models of the existing SDP. In these models (Action Diagrams) aspects such as activities, flows, performer, action and action objects were emphasised (see section 5.2). By creating these models different aspects of the process were highlighted and revealed a number of question marks in the existing description. For example there was an uncertainty concerning result from and connections between activities as well as the performer of an activity (see section 5.3). The problems in existing description as well as the missing parts of the existing description triggered us to redesign the SDP.

When redesigning the SDP we started out in documents that were generated during the reconstruction, ideas for further development and preliminary evaluations that had been made during the reconstruction.

The redesigned SDP was divided into two principle processes in sequence. SDP was reinterpreted to consist of refinement processes, and evaluation and decision processes. The new structure of the SDP is shown in Figure 4. From the beginning the SDP consisted of five sequential processes. The new SDP consists of the following sub processes:

- *Evaluation and decision processes,* which aims at evaluating services, experiences and ideas. The evaluation and decision processes can end up in decisions about service introduction, refinement or liquidation.
    - *Handling of ideas*, which aims at preparing and evaluating ideas from customers and co-workers. The purpose of the sub process is also to decide upon a refinement assignment.
    - *Decision about introduction,* which aims at evaluating results from a pilot application of a service and then making a decision concerning the next step.
    - *Following-up*, which aims at following up existing services and making a decision about a refinement assignment (urgent alteration, planned alteration or liquidation). The following-up is performed recurrently with a certain time interval.
- *Refinement processes*, which aims at realisation of different assignments (decisions made in the evaluation and decision processes) concerning service components and concepts as well as packaging of services.
    - *Concept refinement,* which aims at developing and refining service concepts.
    - *Component refinement,* which aims at developing and refining methods and/or products. Such components can be part of different concepts.
    - *Packaging of services,* which aims at packaging services for marketing and delivery.
    - *Liquidation of service,* which aims at conducting the liquidation of a service

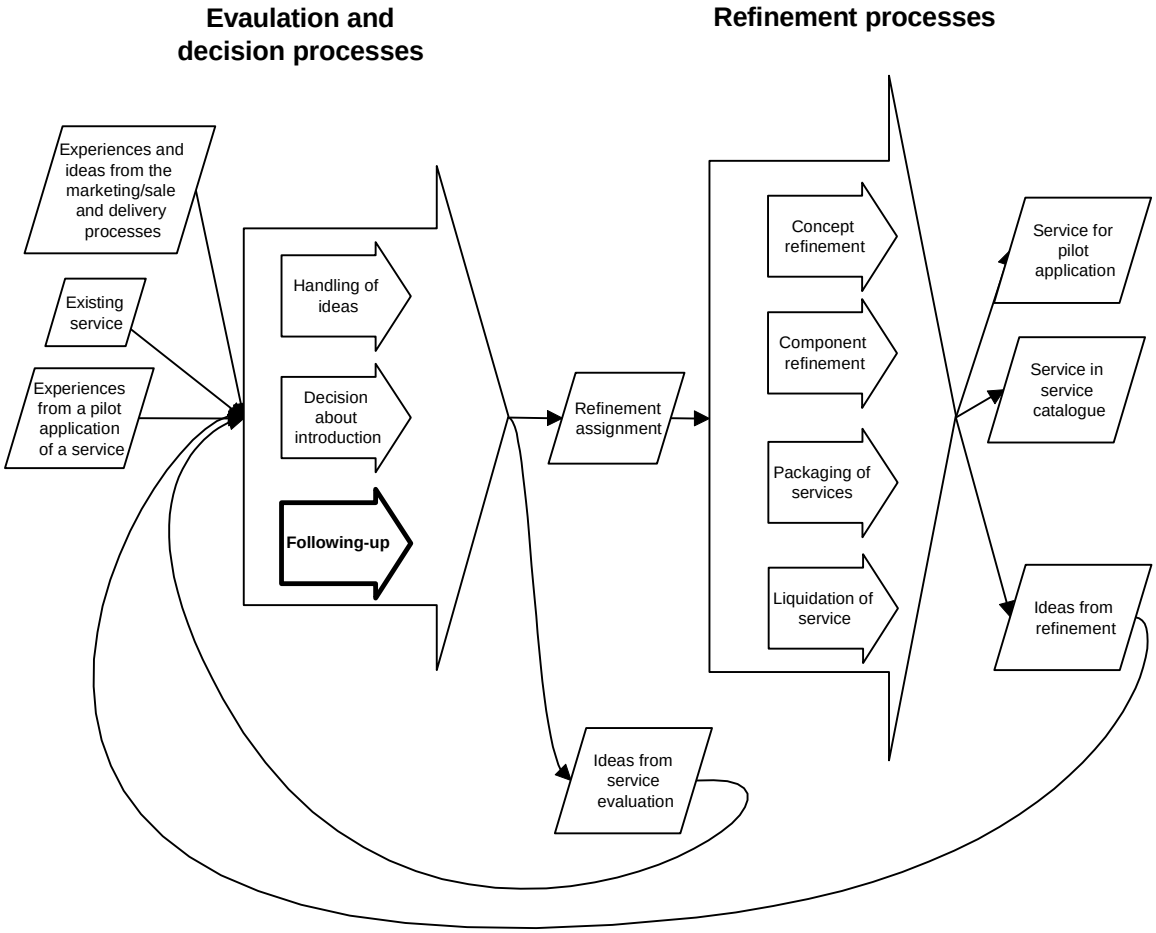


Figure 4: The new SDP

When comparing the existing SDP (Figure 2) and the new SDP (Figure 4) one can see that the new SDP consists of two sequentially related sub processes, which consists of variant processes. The need for regarding the SDP as consisting of variant processes is based on the need for handling different kinds of evaluation and decision making as well as handling different kinds of refinement. The sub processes are related to each other where results from one sub process are used as prerequisites for the next one. The sub processes within the SDP are inter-related and re-coupled in order to support continued development of services. A lifecycle perspective is adapted on services, which is controlled by different following-up activities.

As can be seen in the process description (Figure 4) the labelling of the sub processes has been changed. When the SDP was redesigned, purposes of each sub process became more distinct. *Handling of ideas* in the new process description corresponds to evaluation in the old description. *Decision about introduction* aims at evaluating result from a pilot application of a service and decide upon a refinement assignment, which could be a completion assignment, a packaging assignment, or a new pilot application. *Decision about introduction* corresponds to the evaluation part of the earlier sub process test. The project group decided that the actual application of the service was not part of the SDP, but there was a need to prepare sufficient support for marketing/sales and delivery in order for these processes to perform a pilot application of the service. The evaluation and decision process *following-up* can result in decision concerning urgent alteration, planned alteration or liquidation of a service. This sub process has become one of the essential parts of the new SDP. The sub process corresponds to some parts of the maintenance process and liquidation process in the old process description.

The different refinement processes correspond to the sub processes development and parts of the sub process maintenance in the old process description. The refinement processes consist of a variant process where *liquidation of service* is performed. This sub process

corresponds to parts of the earlier sub process liquidation, where the actual decision about liquidation has been moved to the sub process *following-up*.

The SDP is supposed to handle continued development of existing services, but development of new services is also handled. A considerable alteration of an existing service or development of a new service creates the need for a pilot application of the service. The application of the service is performed in one of the related business processes at ABB. Experiences from the application of the modified or new service is supplied back to the SDP.

The SDP does not act by it-self, the process interacts with the surrounding where other processes at ABB receives result from and delivers result to the SDP. Experiences and ideas from these processes (marketing/sales and delivery) are such result supplied by these processes. Figure 5 show the interaction between the processes, where the surrounding of the SDP is emphasised. Observe that the service catalogue is used in the marketing/sales and delivery processes as well as in the SDP. The service catalogue becomes an essential part for the handling of services.

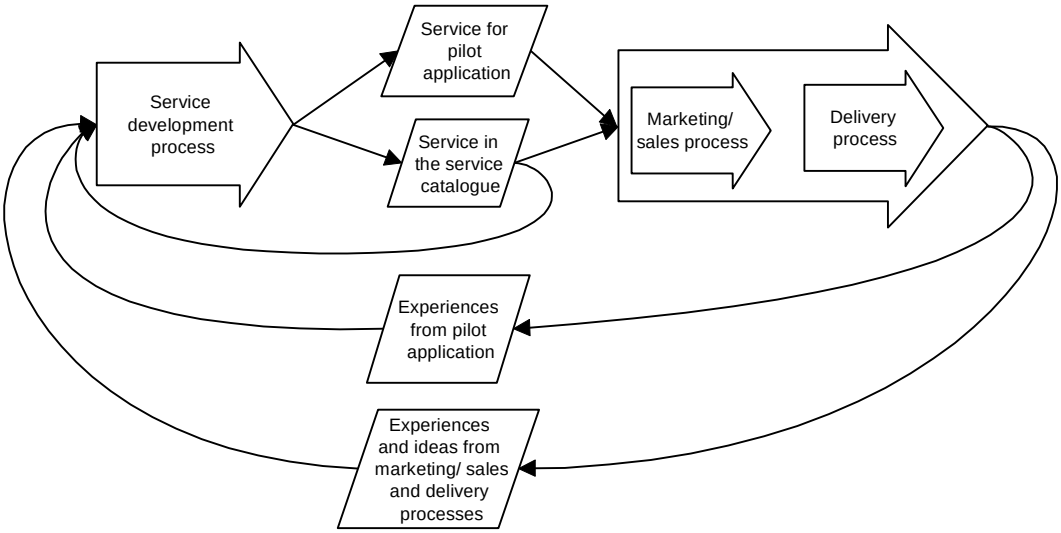


Figure 5: The surrounding of the SDP

By becoming clear about the purpose of each sub processes different types of possible alteration of services could be emphasised. Within the evaluation and decision processes there are different possibilities of making decisions concerning different types of refinement assignments. These are:

- *Handling of ideas*
  - Decision about further development
  - Decision about development of a new service
  - Decision about further evaluation
- *Decision about introduction*
  - Decision about putting the service into the service catalogue (packaging assignment)
  - Decision about not putting the service into the service catalogue
  - Decision about service completion
  - Decision about service modification
- *Following-up*
  - Decision about urgent alteration

- Decision about planned alteration
- Decision about liquidation of service

Such decisions are important criteria for delimitation of sub processes. The possible decisions are based in the perspective of services, i.e. the way that the notion of services is regarded. The decisions covers aspects from an idea to liquidation of service, i.e. a life-cycle perspective has been put upon the notion of services.

When a process is studied and developed it is important to consider the different demands that the surrounding world have on the process. These different demands should be reflected in the way that the process interact with the surrounding world. One part of the interaction is the initiation of the process. The orderer should initiate the process by giving an assignment to the producer. The producers need to know the meaning of the assignment in order to be able to realise it. Many times the surrounding interacts with processes without knowing the routines for delivering the assignment.

4. HOW TO VIEW PROCESSES

4.1 Transformation or assignment

Process thinking is focused in several of the popular development strategies and methods that are used today. BPR (Davenport, 1993; Hammer & Champy, 1993; Keen, 1997) and TQM (Ishikawa, 1985) are such development concepts which focus a corporation's processes in order to achieve improvements. BPR stands for radical improvement and TQM for continuous improvement. We mean that the process perspective is possible to use for many development situations, where reconstruction and redesign of service development processes is one such situation.

"A process is thus a specific ordering of work activities across time and place, with a beginning, an end, and clearly identified inputs and outputs: a structure for action" (Davenport, 1993). This definition implies a transformation perspective on processes, where objects that are being refined are in focus. Inputs become refined to outputs. In many process-oriented development concepts it is common that processes are regarded as transformational processes (see Lind, 1996). This means that a process is structured in the way a product or service becomes refined, which can be seen by the labelling of, the purpose of and the relationships between different sub-processes. The sub processes are the parts of the process and consist of activities that are contextually related to each other. A production process would then be structured in the way the objects becomes refined; from raw material to a finished product. A service development process can also be structured as a transformational process, where the object (the new/existing product or service) becomes refined. Service development includes two cases of refinement. One case is from an idea to a developed service or product ready for the market. The other case is from current service to an altered service. A restricted transformational view only focuses the refinement.

As stated above Davenport (1993) implies that processes need to have beginnings and ends. However, the beginning and end can vary depending on the way the process is regarded. One way is as explained above to see the starting point of the process as the unrefined object (idea, raw material etc.), i.e. regarding the process as a transformation process. Another way is to see the starting point as the request that something needs to be done, i.e. regarding the process as an assignment process. This perspective is based on different communicative acts stated between two parties; the producer and the client. The assignment process can be regarded as consisting of two generic phases (Figure 6):

1. To agree upon the assignment
2. To fulfil the assignment

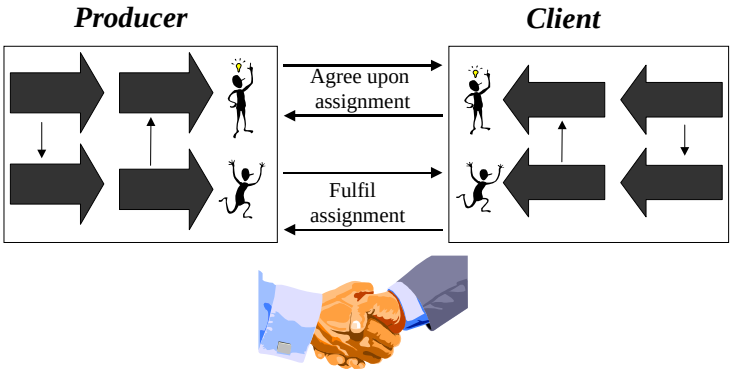


Figure 6: The assignment process (Röstlinger et al, 1997)

During these two phases there is action and interaction performed between the producer and the client. The producer and the client perform different communicative acts directed towards each other. The establishment of an assignment can be performed in many different ways, where different degrees of dialog and interaction between the producer and client are performed. The phase of agreeing upon an assignment (phase one above) can be divided into the following parts (Goldkuhl & Röstlinger, 1998):

1. Propose
2. Design / formulate
3. Examine / evaluate
4. Settle / decide

It is important to regard the phase where the assignment becomes established consisting of the parts above in order to achieve quality in the assignments. The fulfilment phase need to be preceded by a phase where common expectations become established between the client and the producer. This (phase one) results in an assignment directed towards the producer. The assignment is a request that is satisfied in the fulfilment phase. The two phases consist of taking and giving assignments.

The two views, regarding the business process either as a transformation process or as an assignment process, can be combined. However, in order to make it possible to regard a business with such a combination one need to start out in one of the views. Lind (1996) emphasises that the assignment part in processes need to be the basis for structuring processes, where the transformation part of the process is regarded in an assignment context. When producing goods as well as services it is possible to regard the business from an assignment perspective (Röstlinger et al, 1997).

In order to be able to fulfil commitments made in the first phase there is, among other things, a need for supply. When developing new products or services there is of course a need for an idea and/or raw material that is supposed to be refined, but we mean that it is essential that different parties agree upon the assignment. In a commercial situation it is important that customer and supplier establish common expectations before the fulfilment phase is initiated. This situation has been described in the business action theory (see Goldkuhl, 1998). This theory can be used as a theoretical lens when looking upon businesses from a business process oriented perspective. The theory emphasises both the interactions between the customer and the supplier as well as the supply needed for performing different activities. The same view can be adapted on development processes.

The SDP at ABB provides supply both for marketing and selling services as well as for delivering services. In order to make such providing possible there is a need to regard service development as action and interaction, i.e. to regard the service development process as a combined assignment and transformation process. The assignment process should support interaction with the surrounding processes. At the same time we apply a life cycle perspective, i.e. from an idea to a liquidated service, on service development, which is the

transformational part of the process. There is a need for process descriptions that cover both views. The former description of the SDP at ABB only emphasised the transformational perspective, where activities for evaluation and decisions were hidden into refinement processes. In the new SDP we have made a conceptual division into refinement and evaluation/decision in order to emphasise both the assignment and the transformation aspects of service development.

4.2 Sequence and variant processes

As can be seen in the ABB case the original SDP consisted of five sub-processes. These sub-processes were structured in a sequential way. Many process oriented theories focus the business process as consisting of sequence processes. This is often the case when the process notion is put into practice, as for example in process modelling. Generated process models then often consist of sequential processes as shown in Figure 7 below.

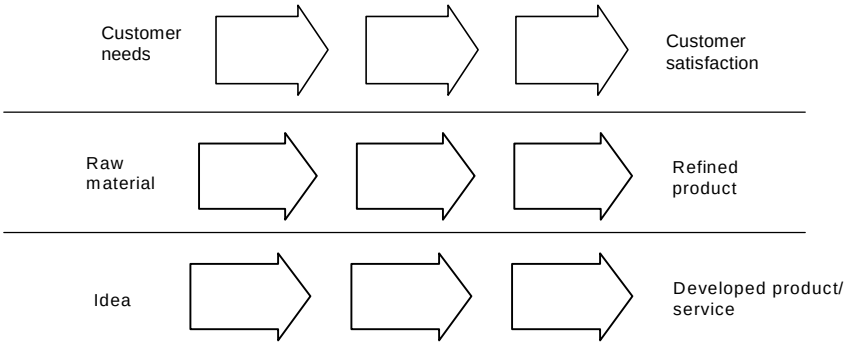


Figure 7: Business processes are often divided in to sequential sub processes

Usually an organisation has different ways of performing business. From our point of view the different ways of performing business have its base in business relationships between supplier and customer, and the internal handling for fulfilling commitments. This means that there will usually be alternative business processes within an organisation, i.e. there exists “variant processes” within the organisation. (Lind & Goldkuhl, 1997)

The concept of regarding an organisation from a variant process perspective does not only concern the operative interaction between the supplier and customer in a commercial situation. In the ABB case study one can see that the new SDP has been restructured by using both variant and sequence processes. Figure 8 below show that sequence and variant processes fruitfully can be combined. This does not only concern different ways of fulfilling customer needs. It can also concern development of new products or services.

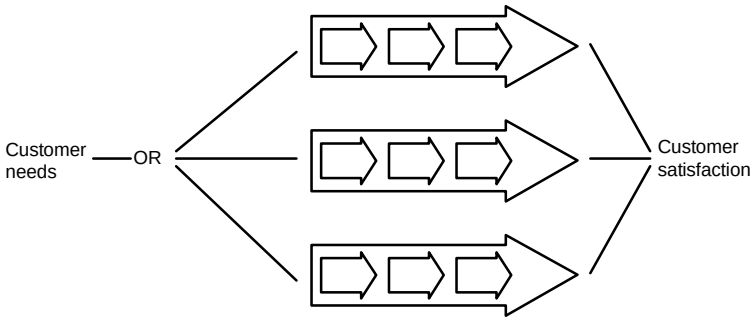


Figure 8: Variant- and sequence processes can be combined

Using the notion of variant processes can be useful when reconstructing and redesigning organisations. To talk about variances is natural for people acting in the organisation. When dividing an organisation into sequence and variant processes there is a need for criteria for delimitation. Such criteria can be based in the language/action perspective (Searle, 1969). One of the criteria used in the ABB case study is the purpose of the sub-processes, where a distinction has been made between evaluation and decision processes versus refinement

processes. This structuring has its base from regarding an assignment process as consisting of the two phases described in Figure 6 above. In the new SDP there was a need to handle different kinds of assignments and different kinds of refinement in order to create competitive services.

4.3 External and internal processes

Within an organisation there are often many different kinds of processes going on. Examples of such different kinds are management processes and operative processes. We characterise the different kinds of processes by using a prefix to the word process. An operative process could either be an external process, which is oriented towards the organisation's surrounding customers and/or suppliers, or an internal process, where prerequisites for external processes are created. All business processes are not external, some are internal and they must be handled in another way because they do not interact with external customers. They interact with other roles, such as providers, internal clients etc. Service and product development processes are examples of internal processes, which are supposed to develop services and/or products that can be used to market, sell and deliver.

The internal processes demand interaction with internal assignment givers and internal clients in order to ensure that created result is of high value. In the ABB case the SDP interacted with marketing/sales and delivery process. This interaction means that actors performing activities in the processes are expressing communicative acts between each other. This demands a high level of intersubjective understanding between these actors. One way to achieve such understanding is by having a good structure of different processes, which reflect both the service notion and the way that services are being handled within the organisation.

4.4 Roles and processes

The notion of processes emphasises the understanding of which activities that are performed and how these activities are performed in order to create certain result. It is also of great importance to study the roles involved in processes as well as the "what" and "how". When a process is being performed different roles are involved and its performance is dependent on prerequisites created by and result delivered to different roles. Such roles are orderer, management, sponsor, supplier and different types of clients. We define a process as follows (see Goldkuhl & Röstlinger, 1998):

A process means that someone – based on an assignment from someone – does something for somebody. This doing (acting) is based on values, rules, knowledge and competence that are established and that can be continuously developed.

This definition implies that there is a need for a common understanding among the actors of different roles that are related and/or involved in the process. Someone and somebody need to agree upon different things. During the ABB case study a role model (see Figure 9) was developed and used in order to look upon involved and related roles as well as the prerequisite created by and delivered to different roles.

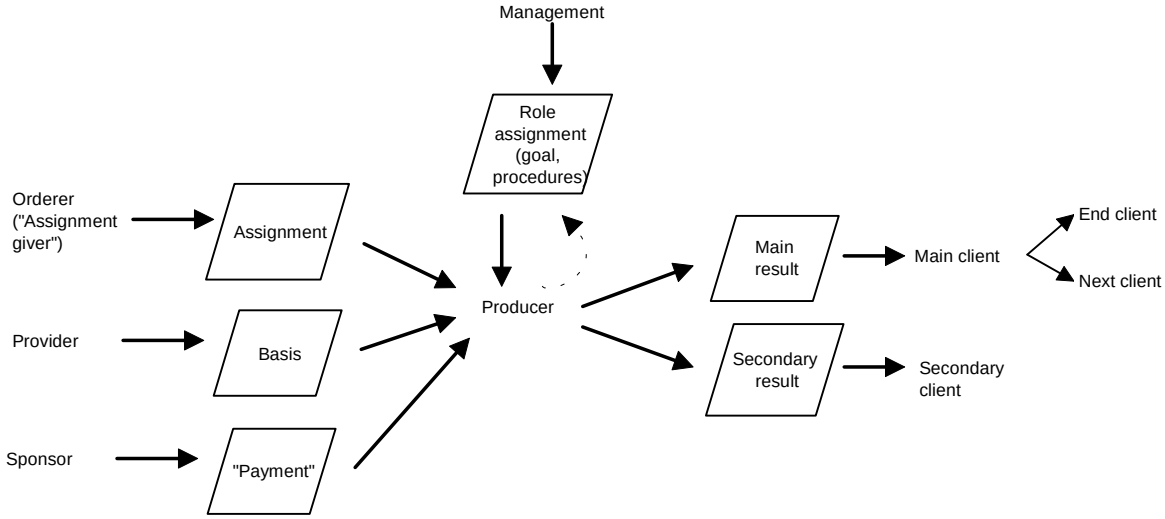


Figure 9: The role model

The producers are those who creates the result in the process. The producer has relationship to different types of clients as well as to other roles that create different types of prerequisites. The producers are receivers and users of different types of result created in earlier processes. Between the different roles there exist relationships, where the assignment relationship between orderer and producer is an example of such relationship. There is an obvious need to establish such relationships in order to have a process of good quality.

When regarding processes (internal as well as external) the processes are divided into sub-processes of different characteristic (sequential and/or variant). By applying the role model on the different processes one can then question and put demands on different prerequisites, which are result delivered from earlier performed processes. In the ABB case study we applied the role model in order to talk about different aspects of the process. This was done both for the SDP as a whole (see Figure 10) and for its sub processes.

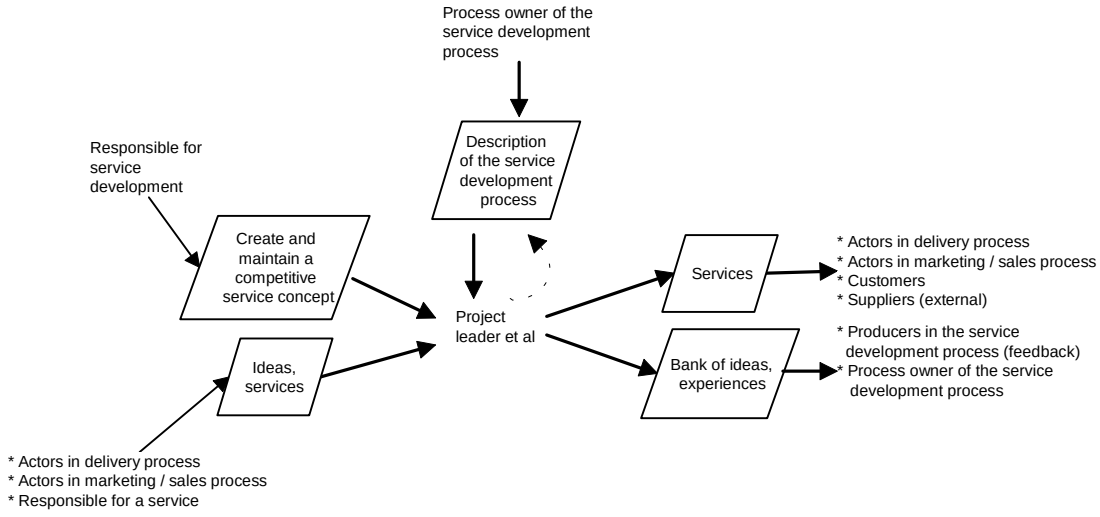


Figure 10: Roles involved in the SDP as a whole

An interesting observation in the role model (Figure 10) above is that one of the clients receiving secondary results are the producers in the SDP. This is basis for reusing experiences achieved in the performance of the SDP. Another observation is that the service development process's relationships to other processes within ABB Infosystems are expressed.

5. HOW TO PERFORM PROCESS MODELLING

5.1 Reconstruction and redesign

In order to redesign business processes there is a need to achieve an understanding of how these processes are performed in the current situation. One should describe the current processes as a basis for redesign. In the ABB case the development work performed was divided into two phases; reconstruction and redesign. Reconstruction was performed in order to create knowledge about the current service development process in order to be able to perform a well-grounded redesign of this process.

The concept of reconstruction is often used in order to emphasise that something is recreated. Something existing, but not exactly known, is made explicit through articulation and description. In a business process, people act and communicate. There are certain patterns of action. There are rules for what actions to perform and what ”action objects” to use and to produce. Such action patterns and rules are social constructs, which can be the result of either deliberate design or continuous evolution. Reconstruction means here reconstruction of such social constructs.

The reconstruction of a business process aims at arriving at a shared understanding of how such a current process is being performed. This includes making explicit different conceptions, action patterns, rules and business language (Habermas, 1979; Goldkuhl & Lyytinen, 1984). Tacit knowledge (Polanyi, 1966) need to be articulated.

The purpose of a reconstruction is both to generate knowledge about the business process that can be critically reflected upon and to assure that later proposed change measures are congruent with those parts of the business process which are left unaffected.

The participants of the reconstruction process (users and analysts) try to convert know-how to know-that. Know-how means the user’s ability to talk, understand and act in social situations (Goldkuhl & Lyytinen, 1984). Know-that means the explicit knowledge of how users can talk, understand and act. A good reconstruction process will establish a number of important results:

- Parts of the business language (vocabulary), different conceptions, and action rules and patterns are made explicit
- Unclear meanings are elicited and clarified among participants
- Participants agree upon different meanings
- Shared understanding of current business processes among participants is established
- A basis for evaluation and critique of current praxis is created
- Quality assurance concerning future changes

The redesign is performed based on the material generated during the reconstruction phase. We use different kinds of models in order to document process and related focal areas. It can be necessary to model, besides the processes, aspects of roles, goals and categories/concepts. An evaluation is an important aspect of creating a good basis for redesign. Evaluation is of course also important to perform concerning the proposed change measures.

Figure 11 shows the development process as consisting of the two phases reconstruction and redesign. These phases can be performed by the support of methods when generating different models of the current and future business processes.

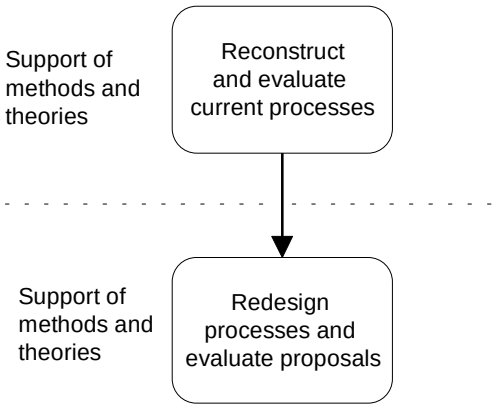


Figure 11: Reconstruction and redesign as phases in a development project

5.2 Contextual modelling

Process modelling is often performed in a top-down fashion. Such an approach - hierarchical decomposition - is often taken for granted in many methods. We prefer an alternative approach: Contextual modelling of processes (Goldkuhl, 1992). When modelling processes by using this kind of approach different *activity contexts* are identified and described. Instead of top-down a ”bottom-all” approach is used. A business process is modelled from its start to its end on an appropriate detailed level. Different activities of the process are described and inter-related. The different activities/actions are named and often described together with their performers; i.e. the actors performing the specified actions. Input and output of each activity are described; i.e. information and material objects.

A contextual approach to process modelling means that the content of processes as well as the processes surrounding is modelled. The content (activities, flow, objects etc) together with its surrounding gives the context. We mean that a process on a detailed level not can exclude such things as information and material flow in order to make it possible to understand the context.

In order to reconstruct and/or redesign processes we describe them on a fairly detailed level using *Action Diagrams*. Action Diagrams are graphical models with a well-defined notation (Goldkuhl 1992, 1996). Analysts and users can use these diagrams together when specifying and modelling information systems and their business contexts. Action Diagrams try to integrate a flow orientation (describing information and material flows) and an action orientation (describing the types of action performed) in one type of description (ibid.). Action Diagrams are therefore appropriate for business process modelling.

A contextual descriptive approach is mainly used when working with Action Diagrams (Goldkuhl, 1992). Each Action Diagram describes a business context (consisting of several activities) within a business process. Different Action Diagrams are related to each others through descriptive connectors (i.e. links to other Action Diagrams). The limits of each Action Diagram (=business context) are arbitrary; i.e. the analyst has the freedom to choose the appropriate borders of the described context. It is possible to combine this contextual approach with a compositional approach describing business contexts on different levels of granularity. So we do not totally reject hierarchical decomposition. It can be used, but in a quite modified way. Usually one uses a bottom-up approach, i.e. aggregating different detailed activities (descriptions of them) to more coarse-grained descriptions. For such survey descriptions it is sometimes possible to use Action Diagrams. We also use another type of modelling technique, Process Diagram (Lind & Goldkuhl, 1997), for this kind of purpose in our methodology - the SIMM approach (SIMM stands for a Situation adaptable Information systems and work context Modelling Method).

The basic description elements of Action Diagrams are found in Figure 12. We describe business contexts consisting of actions, performers and action objects. There are human actors in specific activity roles (e.g. salesman, order clerk and customer). These actors are

performing actions. Actors use resources and instruments in their actions. Actions are performed based on some prerequisites (basis for action), which can be of material nature or information. Results of actions can be action objects of material or informational character. Producing an information object means usually performing a communicative action. A performer can be a human actor as well as an instrument, such as a computerised information system. An important aspect of Action Diagrams is the semantic power to describe *action logic*. It is possible to describe sequential order of actions (i.e. the flow aspect), alternative actions (decision points), conjunctive actions, contingent actions (i.e. actions occurring only sometimes), trigger (initiation) of actions (by time or communication), interruption of actions (by time or communication), condition for actions, and parallel actions.

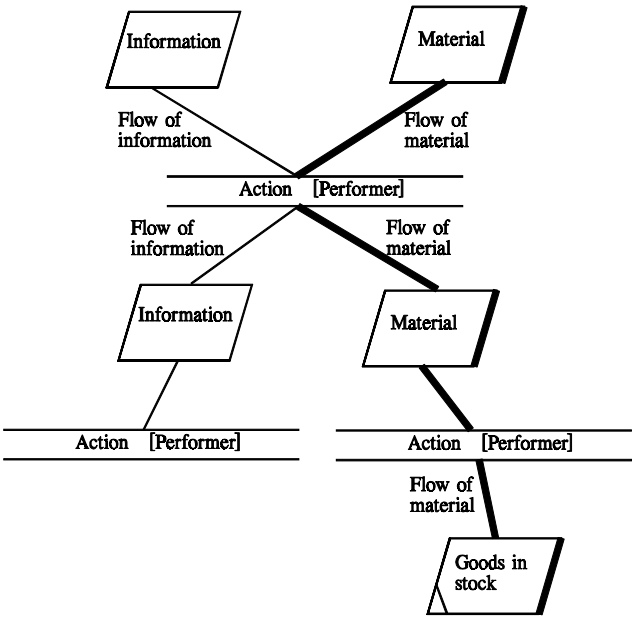


Figure 12: Basic description elements in Action Diagram (from Goldkuhl, 1996)

One purpose for looking upon on a process at different levels of details is to get an aid in shifting focus. In process modelling the survey model is used to achieve understanding of the wholeness, i.e. achieve an understanding of the different parts that a business process consist of. The survey model is a key map used to guide the modeller in navigating between different sub-processes. This also means that an understanding of the details (purpose and role) in the wholeness can be developed.

Action Diagrams can be used for many purposes. In the ABB case we used action diagrams for the following purposes:

- To reconstruct current SDP which was done by converting written textual descriptions and supplementary oral clarifications into models
- To achieve an understanding of the notion of services in different phases
- To describe the “new” (redesigned) SDP
- To create a survey map (overview) based on detailed descriptions

The overviews used in the ABB case study were created from Action Diagrams into process charts (see Figure 4 for an example).

In the case study we created one series of Action Diagrams when reconstructing the SDP and one series of Action Diagrams for describing the redesigned SDP. One Action Diagram of the former SDP can be found in appendix one. The Action Diagram shows the sub process maintenance (see Figure 2 for navigation). As can be seen in the Action Diagram there is a mixture of evaluation, decision making and refinement activities within the same

sub process. Appendix 2 shows an Action Diagram concerning the sub process following-up (see Figure 4 for navigation) in the redesigned SDP. This sub process only includes activities for evaluation and decision-making. It can also be seen in Appendix 2 that different types of decisions are handled. Please note that we have not emphasised the performers in the Action Diagrams shown in the appendices.

5.3 Reconstruction: From text to model

When performing a process reconstruction the source of data can be different. Examples of sources can be interviews of the people in the business, texts etc. At ABB the current SDP was described in their quality handbook, which we used as a base to reconstruct the current SDP.

We used Action Diagrams to convert the text description into models (Action Diagrams). By using Action Diagram aspects such as activities, prerequisites, results, performers etc were focused. When we created Action Diagrams of the existing SDP a lot of "holes" in the textual description was discovered. It is often hard to make written process descriptions complete and accurate. For some of the "holes" we made assumptions based on the understanding of the existing process. For some of the "holes" we could not make any assumptions, we just put question marks.

The assumptions needed to be validated and the question marks needed to be clarified. As mentioned in section 5.1 reconstruction is used in the meaning of reconstructing social constructs. This caused us to validate and clarify, i.e. perform further reconstruction, through discussions with the users who had the business knowledge. This was done through work in seminars. The models created from the text were used in the discussion in the project group, where misunderstandings were clarified and assumptions were validated. We have used the models describing the SDP as a point of departure to discuss and understand the existing SDP. The models were continuously developed. The Action Diagram depicted in appendix 1 has been validated and clarified through seminars.

As can be seen by the Action Diagram in appendix 1 there are still some question marks included in the diagram. There was some hesitation concerning who it was that had the need for alteration and development of services, i.e. which sub processes did the maintenance process interact with. The Action Diagram also reveals a mixture between evaluation, decision making and refinement activities. Planning seems to result in decisions concerning future actions of services, i.e. the planning activity is a mix between evaluation and decision making. At the same time the planning activity does not include decisions concerning liquidation assignment. The activity just results in a signal about possible liquidation of a service.

When we reconstructed the SDP different sources of data has been used. One is the quality handbook, which we used as a starting point for discussions. Another source has been people in the organisation that had knowledge of how service development was performed. Methods such as Action Diagrams has helped us in structuring the data that was analysed, i.e. the reconstruction has been method-driven.

We have a lot of experience from modelling where we earlier have argued for the need of theories as a theoretical lens (see Lind & Goldkuhl, 1997) in order to help the modeller to focus different aspects. The Business Action Theory (Goldkuhl, 1998) is one example of such theory. Another example is the role model, which we used in the ABB case study. By applying this model we asked questions such as:

- What is the assignment and where does it come from?
- On what basis is this process performed and who is providing that?
- What is the purpose of the sub process?
- Who are the clients?

By using both theories and methods for going from text to model we regard the approach as being both theory- and method driven. By applying these approaches the process models could be sharpened in the descriptions. By having detailed descriptions the purpose of different parts could be questioned. The "holes" that were identified were part of the evaluation in the reconstruction process, which became inspiration for the redesign phase of the project.

6. CONCLUSIONS

This paper has been concerned with development of service development processes. Based on a case study it has treated how to view

- service development
- processes
- process modelling and development

The paper is about conceptions and approaches concerning these issues. We propose some shifts and enlargements in conceptions. Service development is about refinement of services and service ideas. But it cannot be restricted to this. This is not the only type of action performed within service development. We propose a shift concerning how to recognise the types of action in service development:

***From** refinement **to** evaluation, decision-making and refinement.*

This shift is based on our action and communication oriented theory for business processes (Goldkuhl, 1995; 1996; 1998; Lind & Goldkuhl, 1997). In this theory we do not restrict processes only to transformation. We have proposed a shift concerning types of actions in business processes:

***From** transformation **to** assignment and transformation.*

When dealing with processes it is many times important to divide them into sub-processes. Prevailing approach to such subdivision is to delimit sequential sub-processes. We propose a shift concerning subdivisions of process:

***From** sequences **to** variants and sequences.*

Process development can be performed in different ways. In pure BPR a clean slate approach is often suggested. We do not agree with such an approach. Concerning process development we propose a shift:

***From** clean slate design **to** redesign based on reconstruction of current processes.*

In process development there is a need for process modelling. Many modelling methods apply a top-down approach. We reject a strict top-down approach. For process modelling we propose a shift:

***From** hierarchical decomposition **to** contextual modelling with supplementary survey models.*

In the case study at ABB Infosystems we started with reconstruction of the current service development process, which consisted of five sequentially related sub processes. We have modelled both activities and links between activities, roles, concepts and goals. This was done in order to create a basis for redesign. During the reconstruction we discovered a number

of aspects that was implicit earlier. These new insights triggered a redesign of the service development process at ABB.

ACKNOWLEDGEMENTS

We are grateful to ABB Infosystems for co-operation in the presented case study. The research presented in this paper has been performed with financial support from the Swedish Council for Work Life Research and the National Institute for Working Life.

APPENDICES

Appendix 1: Action Diagram describing the sub process maintenance in the former SDP

Appendix 2: Action Diagram describing the sub process following-up in the new SDP

REFERENCES

Davenport TH (1993) Process innovation. Reengineering work through information technology, Harvard Business School Press, Boston

Goldkuhl G (1992) Contextual activity modelling of information systems, in proc. of 3rd int. working Conference on Dynamic Modelling of information systems, Noordwijkerhout

Goldkuhl G (1995) Information as action and communication, in Dahlbom B (Ed, 1995) *The infological equation. Essays in honor of Börje Langefors,* Gothenburg studies in information systems 6, Göteborg University

Goldkuhl G (1996) Generic business frameworks and action modelling, in proc. 1st International Workshop on Language/Action Perspective´96, Springer Verlag

Goldkuhl G (1998) The six phases of business processes – business communication and the exchange of value, accepted to the twelfth biennial ITS conference (ITS'98), Stockholm

Goldkuhl G, Lyytinen K (1984) Information systems specification as rule reconstruction, i Bemelmans T (Ed 1984) Beyond productivity: Information systems development for organisational effectiveness, North-Holland, Amsterdam

Goldkuhl G & Röstlinger A (1998) Praktikbegreppet – en praktikgeneriskmodell som grund för teoriutveckling och verksamhetsutveckling (in swedish), CMTO, Linköping University

Gummeson E (1991) Service quality. A holistic view, In Brown SW, Gummesson E, Edvardsson B, Gustafsson B (1991) Service quality. Multidisciplinary and multinational perspectives, Lexington Books, New York

Hammer M, Champy J (1993) Reengineering the corporation. A manifesto for business revolution, Nicholas Brealey, London

Habermas J (1979) Communication and the evolution of society, Heinemann, London

Ishikawa K (1985) What is total quality control? The Japanese way, Prentice-Hall, Englewood Cliffs

Keen P (1997) The process edge – creating value where IT counts, Harvard Business School Press, Boston

Lind M (1996) Business processes thinking in practice, in proc. of 19th IRIS-Conference, Göteborg University

Lind M & Goldkuhl G (1997) Reconstruction of different business process – a theory and method driven analysis, in proc. of 2nd International Workshop on Langauge/Action Perspective'97, Veldhoven, The Netherlands

Normann R (1991) Service management. Strategy and leadership in service business, John Wiley, Chichester

Polanyi M (1966) The tacit dimension, Routledge & Kegan Paul, London

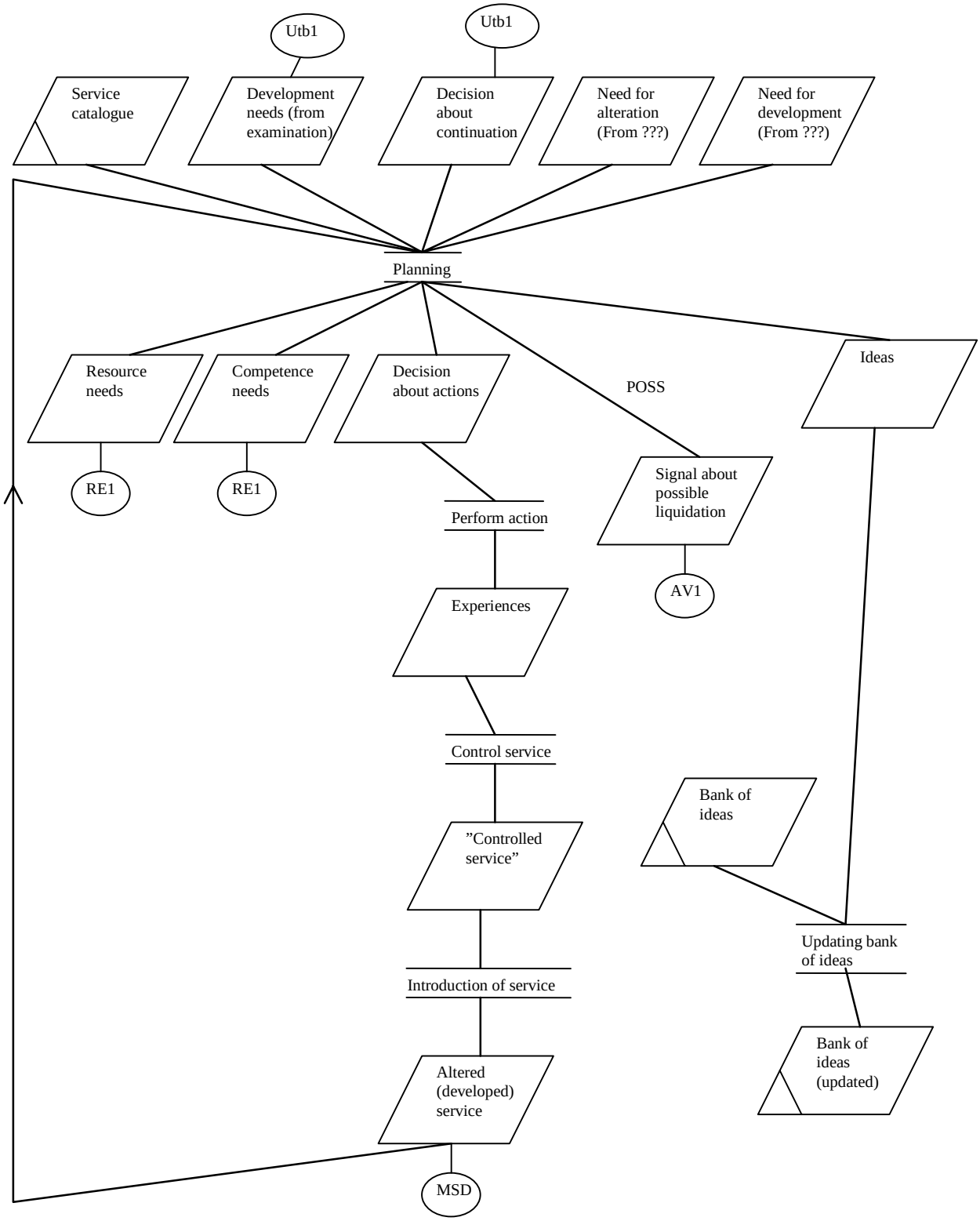
Röstlinger A, Goldkuhl G, Hedström K, Johansson R (1997) Processorienterat förändringsarbete inom omsorgen (in swedish), CMTO, Linköping University

Searle J R (1969) Speech acts. An essay in the philosophy of language, Cambridge University Press, London

ACTION DIAGRAM

Prepared by: ML, GG	**Date**	**Version**	**Reference**	**Page**
	1996-10-21	1	För1	1

Concerning: Sub process maintenance (from the existing SDP) *Appendix 1*



ACTION DIAGRAM

Prepared by: ML, GG	**Date**	**Version**	**Reference**	**Page**
	1996-12-18	1	Upp1	1

Concerning: Sub process following-up (from the redesigned SDP) *Appendix 2*