Dividing Businesses into Processes
Foundations for Modelling Essentials

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Abstract: One important part of information systems development work is business modelling. Traditionally businesses have been regarded as systems consisting of sub-systems. During the 90's a number of process-oriented approaches for business modelling have gained a lot of interest. One problem about dividing businesses into processes is that there resolves controversy around the number of processes appropriate to a given organisation. The difficulty derives from the fact that processes are almost infinitely divisible. It is therefore a need to find basis of division when adopting a process-oriented view on the organisation. This paper reports on ongoing research concerning understanding businesses by using the notion of business processes. Results reported on are a further developed notion of business processes, a reference model for process determination, criteria for process determination and a theory of imperceivable business systems. These results are generated through a dialectic approach where both transformational and communicational aspects of business processes are taken into consideration as well as the notion of systems for perceiving businesses. By using this theory of imperceivable business systems for business modelling essential characteristics of businesses can be focused on different levels of abstraction.

Key words: Business Process, Business Modelling, Systems, Communication, Transformation

1.   INTRODUCTION

In order for organisations to remain competitive in an ever-increasing business climate there is a need for organisations to develop their business performance. Flexibility in different business situations has become an important guiding star, where organisations satisfy different customers in

different ways. Traditionally organisations have in their development efforts focused on their internal activities at the expense of focusing on their environment. In different approaches for organisational development, such as TQM (Harrington, 1991; Rentzhog, 1996), BPR (Davenport, 1993; Hammer & Champy, 1993) and Process Management (Rummler & Brache, 1995), there is an emphasis to focus on the customer to a high degree. Common to all these approaches is that they focus on business processes in order to facilitate a focus on the parties organisations create value for. These approaches emphasise the need for organisations to create value for customers during business performance. It does not matter if organisations improve existing action patterns if they do not have customers to interact with and thus deliver value to. Hammer (1990) emphasises that thinking in processes is a radical new way of thinking. There is a need to think horizontally in order to manage to focus on the customer (Castells, 1996). Business performance should thus be in the foreground and the way to organise in the background according to this new way of thinking.

Thinking in business processes instead of thinking in organisational functions when regarding businesses causes an altered view during organisational change. An altered view on businesses has consequences for the way that organisations act and how people within and between organisations communicate. Such social and organisational issues are dealt with a lot within linguistic (Dietz & Widdershoven, 1991; Goldkuhl & Lyytinen, 1982; Winograd & Flores, 1986) and semiotic (Stamper, 1994; 2000) approaches for understanding the notion of information systems. When business is performed an important part is the organisational language, which includes vocabulary as well as rules for communicative acts (Lyytinen, 1981). When developing information systems these concepts and rules need to be taken into account. An information system is a communication system, since the purpose of the information system is to support the communicative acts between actors within and between organisations. Many information systems used today are constructed to support organisational functions rather than business processes (Melin, 1998).

When developing and evaluating information systems, business modelling is an essential effort. Business modelling is used to reach an understanding of businesses and the support of present and future information systems. Business modelling is concerned with asking questions and documenting answers in business models. Resulting business models are influenced by the underlying perspective (Goldkuhl et al, 1998) used when performing business modelling. A shift from an internal focus to a more external focus when understanding businesses also has consequences for the

perspective used if the intention with the business models is to highlight customer-oriented aspects.

Business modelling has been a highly debated issue for a long time. In the late sixties Börje Langefors introduced the need for performing an object system analysis (Langefors, 1973). This emanated from the fact that a thorough understanding of the business, i.e. the object, is needed in order to understand the business's support of information systems. Langefors (ibid) claimed that businesses are imperceivable systems, but by regarding the business as a system with sub-systems on different levels the observer can perceive the imperceivable system. Humans are not able to cope with too many concepts simultaneously. The systems analysis approach (TOS) presented by Börje Langefors is an attempt to propose a way of working when perceiving imperceivable systems. This approach is based on the idea that the outer properties for a certain system are first defined and then the inner properties by sub-dividing the system into inter-related sub-systems. The sub-systems may be sub-divided further to new sub-systems. This approach can be characterised as a compositional approach.

Since it is possible to understand organisations and their doing of business in different ways, the resulting business models from modelling sessions are much influenced by the perspective used by the modeller. Historically different approaches for business modelling have been introduced, which all have different bases for dividing businesses into different parts. Examples of such approaches are function-oriented approaches (e.g. Yourdon, 1989), object-oriented approaches (e.g. Jacobson et al, 1995), and process-oriented approaches (e.g. Eriksson & Penker, 2000; Ould, 1995; Österle, 1995).

The purpose of this paper is to report on research about foundations for business modelling for the purpose of investigation and change. One such purpose could be to analyse, develop and evaluate information systems. Understanding businesses by adopting the notion of business processes proposed in the literature is however not enough. The notion of business processes needs to be further developed. In order to perceive businesses as consisting of business processes there is also a need for criteria to guide the modeller to find relevant aspects to focus on. Result from this research is further elaborated in Lind (2001).

The paper is structured by starting out in declaring research questions that delimits the research. Based upon the research questions and intended knowledge contributions the research approach is claimed for. Four main results and arguments for these results are then discussed. Discussing some implications that the results from the research have concludes the paper.

2.   RESEARCH QUESTIONS AND RESEARCH APPROACH

When businesses are understood for the purpose of investigation and change, there is a need to construct business models. These models should consist of categories that reflect intended aspects to highlight. This leads to my first research question, which is a question that traditionally has been an object of much research:

–   *How should businesses be understood for the purpose of investigation and change?*

To perceive businesses is a process of delimiting and dividing business components. This work is called determination. Depending on the level of abstraction certain aspects need to be focused at each level, whether a compositional (top-down) approach or an inductive (bottom-up) approach is advocated. This leads to the following research question, which is derived from the research question above:

–   *What aspects are important to take into consideration when business components are determined for the purpose of investigation and change?*

Aspects to take into consideration are many. The trend of the nineties is to regard businesses as consisting of business processes. This leads to the following research question:

–   *What are the implications of applying a process perspective on businesses?*

The aim of the research is to generate criteria for process determination that can be used when performing business modelling. The need for knowledge about process determination has been recognised by others.

> Considerable controversy resolves around the number of processes appropriate to a given organization. The difficulty derives from the fact that processes are almost infinitely divisible; the activities involved in taking and fulfilling a customer order, for example, can be viewed as one process or hundreds. The 'appropriate' number of processes has been pegged out from two to more than one hundred (Davenport, 1993, pp. 27-28).

This statement by Davenport is based upon a lack of solid foundations for dividing businesses into processes. The notion of business processes used today is insufficient for adopting a process perspective on the business. This leads to the following research question:

–   *What is a suitable notion of business processes as a foundation for determining business processes?*

Determination of parts and wholenesses of businesses needs to be supported by procedural guidelines in order to make the knowledge useful

for people performing business modelling. This concerns both aspects to take into consideration as well as approaches for moving between different levels of abstraction. This leads to the last research question:

– *How should process determination be performed?*

The main results from the research are a further developed notion of processes, a reference model for process determination, criteria for process determination, and a theory of imperceivable business systems. The knowledge developed has different characteristics. A notion of processes is a perspective, which consist of categories, definitions, values and goals (Goldkuhl et al, 1998). The reference model includes process types and an identification of desired criteria. The reference model as well as criteria for process determination represent categories, with main- and sub-classes, within a perspective. A perspective consists of explanatory knowledge, categorical knowledge, and value-based knowledge. Based upon the perspective, i.e. the notion and the criteria, procedural guidelines can be generated. These procedural guidelines are covered within the theory of imperceivable business systems. Procedural guidelines are rules for action (c.f. action science by Argyris et al., 1985).

The research is about understanding and explaining how people act and interact in practices in order to conceptualise businesses using the notion of processes. A qualitative approach is therefore preferred. A strict inductive approach is however not the best approach. In order to reach grounded knowledge (Goldkuhl, 1999) for process determination there is a need to apply a theory-driven, inductive and modelling-based approach. As argued by Walsham (1995) a strict inductive way of doing research could be restraining since it neglects the possibilities that the researchers pre-knowledge and other theories may possess in his or her effort to interpret and elaborate the findings (cf. Glaser & Strauss, 1967). Pre-knowledge and theories are therefore used to create added power in the efforts to analyse and modulate empirical findings. The pre-knowledge and the theoretical framework also create the incentive to encourage and push the research process further to reach analytical depth. The character of the process can therefore be described as iterative where theoretical aspects have been used to analyse, evolve and grasp the empirical findings as well as pursue the process forward.

The research involves a dialectic approach by studying theses and antitheses in order to formulate syntheses. The dialectic approach means that the synthesis includes positive characteristics from the thesis and the antithesis (Skirbekk & Gilje, 1993). Thereby the negative characteristics and oppositions are avoided and it is possible to go beyond the thesis and the antithesis. Development arises from a thesis contrasted with an antithesis, which are united in a superior synthesis (Føllesdal et al, 1993). Within the

research there exist dialectic relationships on two levels; between the system-oriented view and process-oriented for perceiving businesses, and between the transformative view and the communicative view on business processes.

The empirical data in the research are generated from action-research oriented (Checkland, 1991; Jönsson, 1991; Walsham, 1995) case studies in which business processes have been in focus. The empirical data can be categorised as two different kinds; primary and secondary data. The primary empirical data have been generated from change projects in which I have been an intervening and participating observer. Primary data have been used from eight case studies. Since the businesses involved have different characteristics, the aim has been to generate a rich and supplementing picture of possible ways to divide businesses into processes. The secondary empirical data has been generated from five case studies, in which I have not participated. There are two arguments for using secondary data; to create an even richer picture and to ensure that the result of the research is not based exclusively on questions asked by myself. Others' interpretations of businesses are important in order to create a theory that can be used in other situations and by other investigators.

The data that have been generated from the case studies have been documented in business models of different kinds. Examples of such models are action diagrams (Goldkuhl, 1992), process diagrams (Lind, 1996), business definition (Goldkuhl & Röstlinger, 1999), interaction diagrams (Christiansson, 1998), and co-work diagrams (Röstlinger et al, 1997). Since action diagrams give a detailed and contextual understanding of businesses, these have been used as a fundamental source of inspiration for empirical findings. Demands put upon the secondary data are that action diagrams have been used. Models have been used for data collection, structuring empirical findings and presentation of the result, since models have the characteristics of putting intended aspects in focus.

In the research a combined theory-driven, inductive and modelling-based approach is applied. Theory has been used both as inspiration for the empirical studies and as an analytical tool between the case studies as well as after the case studies. The research can be categorised as consisting of two phases: an empirical-oriented phase, and an analytic-oriented phase. In the first phase primary empirical data has been generated and in the second phase secondary as well as primary empirical data have been analysed.

3. RESULTS

Four main results of the research have been reached. These are a further developed notion of business processes (1), a reference model for process determination (2), criteria for process determination (3) and a theory of imperceivable business systems (4). To perform process determination there is a need for criteria, where these criteria should be based on a notion of processes. By examining a number of different process oriented approaches for business modelling, I have come up with an alternative notion of processes. This is a synthesis that transcends the opposition between the transformative view on processes (the thesis) and the communicative view on processes (the antithesis). Based upon the further developed notion of processes and empirical findings, the reference model and criteria for process determination have been formulated. By regarding the system-oriented view of dividing businesses into components as the thesis and the current way of regarding business processes as the antithesis the second synthesis, i.e. the theory of imperceivable business systems (4), is formulated by taking the other results (1, 2 and 3) into consideration.

3.1 A further developed notion of processes

During the 90's a number of customer-oriented approaches for organisational development have gained a lot of interest. Examples of such approaches are Business Process Reengineering, Total Quality Management, and Process Management. All these approaches emphasise the need to focus on business processes. These approaches apply a process-oriented view on business performance, which means that transformation of input to output is in focus. In contrast to a transformative view on processes there is also the communicative view (e.g. the language/action-oriented view) (Austin, 1962; Searle, 1969; Habermas, 1984). This view is based on the idea that communication is not just transfer of information. When you communicate you also act. As a reaction against the transformative view on processes there also exist a number of process-oriented approaches for business modelling[30] based on the language/action perspective. By applying a communicative view on processes establishment and fulfilment of commitments are emphasised.

These two views, i.e. the transformative and the communicative view on processes are in conflict with each other. A notion of processes used for

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[30] Example of approaches based upon the language/action perspective are Action Workflow (Medina-Mora et al, 1992), DEMO (Dietz, 1999; Reijswoud, 1996), which are influenced by the conversation-for-action schema (Winograd & Flores, 1986)

developing information systems needs to be based upon an understanding of how communication is performed within and between organisations. There is however also a need to understand how transformation is performed. It is therefore not possible to reduce our understanding of a business to just communicative acts or material acts. We need to base our understanding on social action (Goldkuhl & Ågerfalk, 2000), which has the consequence that transformative aspects of processes need to be regarded from an assignment point of view. Assignments are agreed upon, fulfilled and concluded through communicative and material acts. The transformation of basis to results is part of the fulfilment of the assignment. This synthesis is depicted in figure 1.
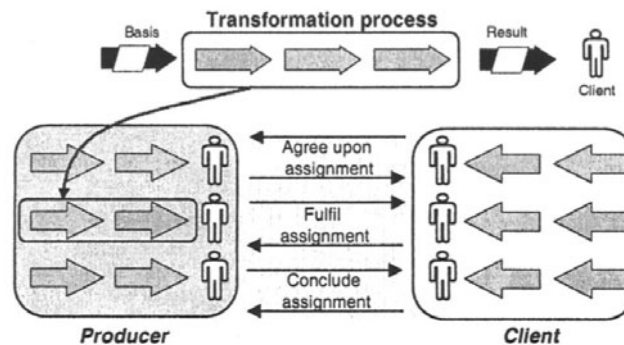

Figure 1. Synthesis: Transformation in an assignment context

One of the fundamental characteristics of business processes is client-orientation. There is therefore a need to understand the ways that interactions with clients are performed. In business interaction, business acts (Lind & Goldkuhl, 2001) are directed from the producer to the client as well as from the client to the producer. These business acts, which are derived from the notion of social action, are part of the interaction logic between organisations. Genuine business interaction is about exchanges between producers and clients. A business process consists of a number of exchanges between a producer and a particular client (Goldkuhl, 1998; Axelsson et al, 2000; Lind & Goldkuhl, 2001).

Business acts directed from and to producers need to be prepared and taken care of. It is essential that proposals and commitments made by producers are founded on their ability (c.f. Goldkuhl & Nilsson, 2000). Production and deliveries made during business performance should correspond to the commitments made by the producer. Producers act on behalf of the organisation(s) (ibid). This means that assignments taken, i.e. commitments made, need to be deployed within the organisation and sometimes also transferred to other organisations. Processes can therefore

not only be oriented towards the client. In order to satisfy present and future needs of the client, interactions need to be performed with other parties related to the organisation. By focusing on actor relationships, based upon the theory of practice (Goldkuhl & Röstlinger, 1999), such parties and consequently business acts constituting different business processes can be identified. There is therefore a need to regard processes as both clients and producers. Other actors related to business performance are for example providers and condition creators.

Organisations often have different ways of performing business (Lind, 1996; Lind & Goldkuhl, 1997). This means that there exist variants of business processes. These variants have implications on the logic of interaction between producer and client, actor relationships, the ways that transformation is performed and the different products that are agreed upon and later on delivered.

In order to understand the interaction between the producer and the client a generic-layered pattern has been developed (Lind & Goldkuhl, 2001). The development of this pattern has been inspired from Weigand et al (1998ab), who have made an attempt to integrate a number of L/A-oriented approaches for business modelling to a coherent wholeness.
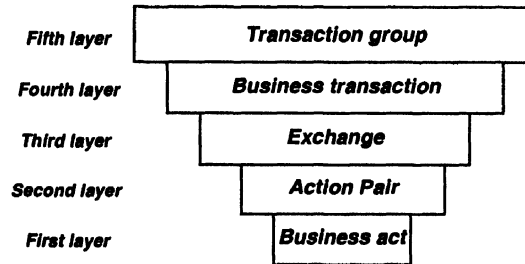
Fifth layer	**Transaction group**
Fourth layer	**Business transaction**
Third layer	**Exchange**
Second layer	**Action Pair**
First layer	**Business act**

Figure 2. Layers of generic patterns for business modelling (Lind & Goldkuhl, 2001)

The generic-layered pattern model consists of five layers (see figure 2); business act, action pair, exchange, transaction and transaction group. Each higher layer is derived from lower layers of pattern. A business act, which can be communicative and/or material, is an act performed by one business party and addressed to the other business party. An action pair is two interrelated business acts, which are related by patterns of triggers and responses. An exchange is one or more action pairs dealing with the same exchange topic. A business transaction consists of four or five distinct types of exchanges. A transaction group consists of one or (often) more business transactions preceded by a business interaction of relationship management (a long term contracting). Relationship management consists of exchanges of two or three distinct types of exchanges.

The further developed notion of processes based upon a transformative as well as a communicative view on processes and empirical findings, implies that:

- there is a need to separate actions performed for potential and particular clients
- processes can not exclusively be regarded as transformation or communication; transformation needs to be regarded in an assignment context
- processes can not exclusively be regarded as sequentially related sub-processes; there exist variants of processes consisting of sequentially related sub-processes
- a one-sided focus on the client is not sufficient; there is also a need to focus on providers and other parties related to the business
- an asymmetric view on client satisfaction is not sufficient; reciprocal relationships between client and producer are a condition to emphasise satisfaction for both parties

Criteria for process determination can be regarded as categories to focus on when dividing businesses into different business processes. These categories influence questions to ask and ways to document answers when performing business modelling. Methods for investigation and development work (e.g. business modelling) are based upon an underlying perspective. The further developed notion of processes is an underlying perspective, which includes important categories, on businesses that is the proposed base for process determination.

3.2   Reference model and criteria for process determination

Three fundamental process types can be identified based upon the Theory of Practice (TOP) (Goldkuhl & Röstlinger, 1999) and the further developed notion of processes (see section above). These process types are parts identified through the reference model (see figure 3). Since the transformative view is regarded in an assignment context in the further developed notion of processes, there is a need to distinguish between *delivery processes* and *providing processes*. Delivery processes are processes that cover the interaction with particular clients and providing processes are processes that establish conditions for the interaction with the particular client by providing a basis for possible further refinement. In providing processes actions performed for potential clients are covered. These actions are oriented towards establishing delivery potentials. Potential clients can mean any client. Both delivery and providing processes cover operative work. Other conditions, i.e. work for potential clients, created for

delivery processes, i.e. interaction with particular clients, are for example product development, instrument development etc. Such aspects are covered in *condition creating processes*. The work covered by this kind of processes is development-oriented for meeting future demands from particular clients.

As a result of the research businesses are regarded as interplay between different process types in order to create value for particular clients (see figure 3). A business is constituted by a composition of actors producing value for clients by using basis from providers. A business is therefore a part of a value chain, i.e. a part of a larger business system. The business is regarded as consisting of the three process types in which interaction with external parties, such as clients, providers and condition creators, takes place.
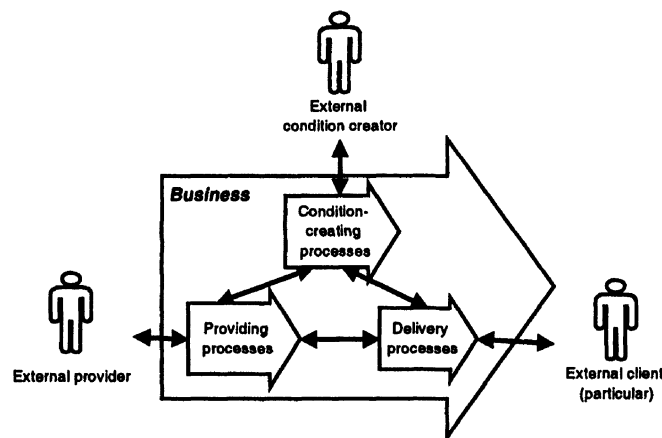

Figure 3. Reference model: Different processes types

Note that the assignment view on businesses implies that each process consists of actions for reaching, fulfilling and concluding agreements. Based on the assignment view on processes there is also a need to ensure that assignments are deployed throughout the organisation and further transferred to other organisations. This means that each process will have a producer role, but also a client role since the process is dependent on conditions provided and created by other processes or external actors.

The further developed notion of processes claims that processes exist in variants. This is based on the fact that different actor relationships exist between clients and producers, and that different products are often offered, specified, refined and delivered in businesses. Examples of different actor relationships are long-term and short-term agreements, which implies different interaction patterns such as transaction group and transaction (see section 15.4.1 above). Products exist in different classes (c.f. Goldkuhl & Röstlinger, 2000), can be of different types, with different characteristics.

Examples of different product classes are goods for transfer and treatment of client. Some products can be standardised and some products are customised, which are the extremities of product types. The possibility of handling standardised products is determined by the basis needed for a certain product class. Dependent on the actor relationship and the product handled the interaction with the particular client will vary. A unique combination of a certain kind of actor relationship and a certain product determines a delivery variant, i.e. a variant of delivery process. Each delivery variant includes and supports a logic of interaction.

Since delivery processes exist in variants there is also a need for providing processes to exist in variants. This idea is based on the foundation that different delivery variants need different bases for their refinement of products. The basis used for possible further refinement in a delivery variant is dependent on the degree of client-orientation, i.e. the degree of adaptation of the product for the particular client (c.f. Wortmann, 1991). Performing business with a *high* degree of client-orientation implies that delivery processes cover a lot of the work, and performing business with a *low* degree of client-orientation implies that a lot of work is instead covered within providing processes. There is often a mix of client-orientation in many businesses, which is handled by variants of delivery processes and consequently variants of providing processes. A unique combination of basis for and result of providing processes determines a providing variant, i.e. a variant of providing process.

Since there exist variants of delivery and providing processes there is a need for criteria concerning horizontal delimitation of the variants and criteria concerning sequential relationships between delivery and providing variants. Horizontal delimitation and sequential relationships can be handled by using matrices combining aspects for process determination mentioned above (see figure 4).

Combinations of criteria from two classes of criteria (product and actor relationship) constitute horizontal delimitation of delivery processes. Within each criteria class some criteria are superior to others. By regarding product class as superior to product type and product type as superior to product characteristics the essentials concerning products will be focused. By regarding the kind of agreement (short-term vs. long-term) superior to the kind of producer (internal or external) the essentials concerning actor relationship will be focused.

The matrices in the figure above indicate a need to sequentially relate variants of delivery to variants of providing. By relating variants of business processes, i.e. providing and delivery processes, different variants of refinement can be determined. Refinement is about transforming basis to products aimed for the external client. This is in line with the further

developed notion of processes, which is based upon but transcends the transformative view on processes. Variants of transformation are a consequence of regarding transformation in an assignment perspective. Coming to an agreement, fulfilling the agreement and concluding the agreement are regarded as more essential than the ways of transformation handled in the business. The transformative aspects of the business are however recognised, which is in line with the unit of analysis used: the notion of social action.
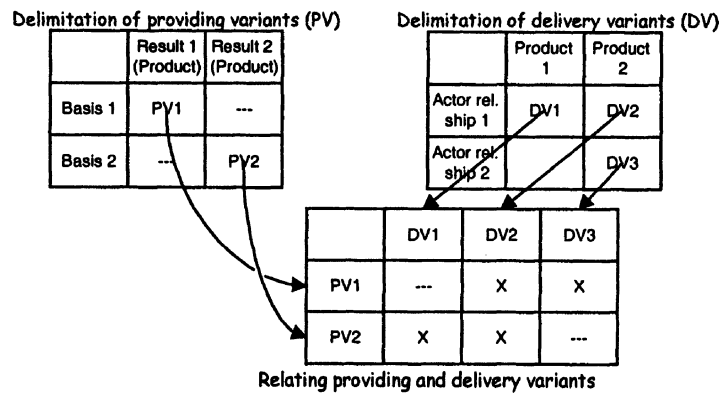

Figure 4. Matrices for horizontal and sequential relationships

Other condition creating processes are about establishing conditions for the providing and delivery processes to function. Examples of such tasks found by the empirical studies are product development, instrument development, marketing, development of relationships with potential fulfillers etc. In order to manage a client-orientation of the business, these processes can not function without getting conditions from other processes. This means that there is often an interplay going in both directions, i.e. from and to other business processes. Such interplay is handled within contextual overlaps between the processes. These kinds of processes can be determined by using categories explicated in TOP.

3.3   The theory of imperceivable business systems

A method is guidelines for work. Its character is prescriptive. A method tells what to do in different situations in order to reach certain goals. Methods for information system development include representational guidelines, i.e. modelling techniques or notations, as well as procedural guidelines, i.e. how to work and what questions to ask (Goldkuhl et al, 1998). Many times the *procedure* and *notation* are tightly coupled together. Modelling is about asking questions and documenting answers in different

models. General *concepts* are used when asking questions and are also parts of the notation. The concepts can therefore be regarded as the glue between procedure and notation. All methods are based on some implicit or explicit *perspective*, which includes values, principles and categories. An example of perspective is the further developed notion of processes. Methods also consist of *framework* and *co-operation procedures*. I have however so far just taken methodological consequences concerning procedural guidelines and concepts into consideration. These procedural guidelines and concepts are based upon the further developed notion of processes and upon proposed criteria for process determination, which can be regarded as the perspective.

Langefors' approach for perceiving businesses by regarding a business as a system with sub-systems on different levels is a way of working that can be called a compositional approach. Handling information systems in businesses implies investigations, where such investigations are characterised by analysis and design of different aspects. Investigative work is about moving between detail and wholeness, i.e. shifting between different layers of abstraction. Such tasks can be handled by using the notion of systems with inter-related components. Different levels of abstraction imply that different aspects need to be focused on at different levels. This means that certain categories, when asking questions and documenting answers, are in the foreground on a certain level. Other categories are thus in the background or not covered at all.

The way of working proposed by Langefors can however be questioned. The notion of systems can be applied in different ways. The way a component is constituted depends on the purpose with the modelling and the underlying perspective. This might have the consequence that intended categories are not in focus since too much focus is put on constructing components and not on meaningful models. A reaction against a strict compositional approach is the contextual approach (Goldkuhl, 1992). By dividing systems into different layers of sub-systems one will not arrive at an understanding concerning how all components are inter-related at a certain level. I claim that processes are contextually related actions (see also Lind, 1996). Process-oriented business modelling can however not be reduced to be only a contextual approach. A combined compositional, contextual and inductive approach is preferable (Lind & Goldkuhl, 1997).

In figure 5 methodological consequences of a further developed notion of processes, the reference model and criteria for process determination have been taken. The figure shows that different categories are in focus on different levels, i.e. different concepts to use when asking questions and documenting answers. The categories generated, i.e. criteria for process determination, should be seen as predetermined well-founded categories to focus on when dividing businesses into processes. There can however be

situations when the predetermined categories are not applicable to the business in focus. Then there is a need to go directly down to the contextual layer and then generate meaningful parts inductively. This also means that the generated categories might not always be useful, but the categories should be sufficiently well-grounded to allow a number of situations to be covered. The arrows in figure 5 indicate ways of working, where a compositional, contextual and inductive approach is combined.
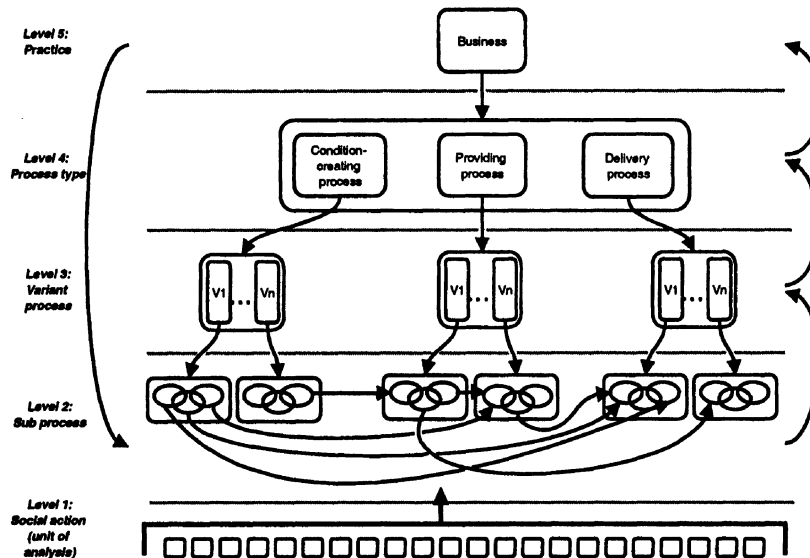

Figure 5. Approach for process determination based on the developed process notion

Figure 5 shows that one starts out with defining the business by specifying outer properties according to categories in TOP. In this step one will also classify the products that are offered, specified, refined and delivered in the business. Based upon these outer properties it is also possible to move down to the next layer where the business is divided into the three process types, i.e. inner properties at the second level. This is done by separating work for potential and particular clients as well as separating between operative and "development" oriented work. On the next layer different variants of each process types are determined. This is done by horizontal delimitation. Each variant process forms a meaningful context consisting of several overlapping contexts. On the second lowest layer depicted in figure 5 different contexts are given a content and are related to each other. This is done by regarding actions as components in contexts related to each other. Actions are situated on the lowest layer, which are regarded as the unit of analysis. Since actions are dependent on conditions created by other action components in other variant processes for other process types variant processes can be sequentially related to each other.

On each level of detail a number of questions can be asked. Examples of such questions on each level are:

- Practice level
  - What different kinds of assignments are handled in the business?
  - What classes of products are exposed, specified, refined and delivered?
  - Which products are tailor-made for the client?
  - What products are standard products?
  - What kinds of instruments are used?
  - Which providers does the business receive their base from?
- Process type level
  - What different kinds of products are delivered to particular clients?
  - What products are refined for potential clients?
  - What kinds of adaptation are made for particular clients?
  - What kinds of development results are refined by the business?
  - What different kinds of actor relationship are handled by the business?
- Variant process level
  - What unique combination of actor relationship and products exist?
  - What unique combinations of bases and results exist?
  - Which bases are needed for different delivery variants?
- Sub process level
  - What actions are performed?
  - What are consequential actions?
  - What prerequisites are needed for a certain action?
  - Which action type does a certain action represent?

The research does not favour a certain modelling technique, i.e. notation. The aim has instead been to develop an understanding of categories, i.e. concepts, to focus on in order to ask appropriate questions and document appropriate answers at different levels of abstraction. By using such categories people can reach an understanding of a business's different business processes in a well-grounded way. This is in line with a theory- and method-driven approach for business modelling (see Lind & Goldkuhl, 1997).

The approaches indicated by the figure above (figure 5) together with the questions to ask at different levels of abstraction constitute the theory of imperceivable business systems. This theory, which is a synthesis, transcends contradictions in the thesis (a system-oriented view for perceiving businesses) and in the antithesis (a process-oriented view for perceiving businesses).

4. IMPLICATIONS

The research has several implications for different areas. The research is aimed towards researchers and practitioners who have an interest in business and system development. The research deals with a subject that concerns aspects to put in the foreground in businesses in order to capture the essentials when performing investigation and development efforts. The research has highlighted a need for becoming aware of essentials as well as proposing some essentials in line with the notion of business processes. Such essentials are variants, actor relationships, different kinds of clients, products etc. Since modelling efforts need to be efficient, it is necessary to make well-grounded reflections about essentials to focus on at different levels of abstraction.

Business modelling is about asking questions and documenting answers. Since business models are simplifications there is a need to be aware of what questions to ask and how to document the answers in different situations. When one wants to adopt a process-oriented view on the business, categories developed in this research can be used for such task.

An approach for business modelling, i.e. way of working, inspired by Börje Langefors' concept for perceiving businesses has been proposed. This approach combines a compositional, contextual and inductive approach in order to reach a coherent documentation of the business covering different levels of abstraction. It recognises the need for contextual understanding based upon the notion of social action as well as the need for sometimes developing knowledge on a detailed level in order to find categories that can be used for determination on higher levels. When performing business modelling it is necessary to combine a theory- and method-driven approach in order to capture the essentials of the business.

Dividing businesses into business components needs to be done on good foundations. By the notion of systems governing and governed systems are in focus. As a reaction against such a notion, there are many arguments for a client-oriented view. One result of this research is a solid foundation for dividing businesses into processes, which recognises external demands. Business processes are perceived as contextually related actions with the aim to fulfil needs for the external client, which is a synthesis based upon the notion of systems and the notion of business processes.

When performing development of information systems and other development efforts there is a need to establish good conditions for further development work. Development of information systems needs to be based on a communicative view on businesses, where material acts are understood in a communicative context. Such a view on the business with supporting information systems is the basis in the synthesis developed in the research.

This synthesis reflects a combination of transformative and communicative foundations for understanding businesses. Such foundations should also be in focus in other focal areas, such as problems, goals, strengths etc, when performing development work.

It is important to notice that the result of the research is a theory of how to perceive businesses. In order to implement business processes in the business there is a need to take organisational and responsibility aspects into consideration. Through the research meaningful abstractions have been proclaimed for, which can be used as a basis for organising the business. It is common that businesses that perform development work focus too much on responsibility and thereby forget about the essentials: to ensure that value is created for clients. The knowledge developed from this research is a preceding step for organising the business. Using the notion of business processes as a basis for organising is, however, a matter for further research.

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