**Participatory Development of Enterprise Process Models**

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**ABSTRACT**

In this paper we present practical experience from using a technique we call Modeling Conferences, a method for participatory construction and development of enterprise process models. Process models are an important way to support communication, coordination and knowledge development within an organization. The Modeling Conference method focus on broad participation from all actors in the organization, is grounded in a social constructivist perspective, and has its theoretical basis in the method of search conferences and process modeling. In an engineering consultancy firm, the Modeling Conference method has been used to develop process models for main common work tasks that have been implemented on an Intranet. Independent evaluations show that participation through the Modeling Conferences led to significantly more ownership to the process models, and that the actors have developed new collective knowledge.

**Keywords:** Process Modelling, Enterprise Modeling, Enterprise IS, IS Models, Case study, Process Improvement, Knowledge Management, Business Process Re-engineering, User Involvement, User Participation, Internet-based technology, Intranet
INTRODUCTION

The Modeling Conference is a method for participatory construction and development of enterprise models. In this, it takes as a starting point the business processes approach to understanding how organizations work. However, while most approaches to the mapping and "re-engineering" of business processes tend to be expert and management focused, the Modeling Conference technique focuses on participation from all the related parties, and the link between organizational learning and institutionalization through technology.

The focus on participation stems from a constructivist approach to understanding organizations. Organizations are seen to be a continuous construction and reconstruction of an organizational reality as individuals and groups enact their own local reality through everyday practice (Berger & Luckman 1966, Gjersvik, 1993). In order to introduce change in the organizational construction processes, the method of change should reflect the joint participation in the everyday construction processes. Because of this, we have developed a method that has at its core the method of Search Conferences (Emery & Purser, 1996).

In the next section, we will present the background to our approach. In the third section the Modeling Conference method is outlined, and in the fourth section the application of the method on a specific case is presented. In section five the results from independent evaluations of the longer-term results from using the approach are presented. In the final section general experiences from applying the approach in different settings are summarized, and further work is pointed out.

BACKGROUND
Processes have been a key concept in management and organization for the last decade, especially related to Business Process Reengineering. A process has been defined as "(…) a structured, measured set of activities designed to produce a specified output for a particular customer or market. It implies a strong emphasis on how work is done within an organization" (Davenport, 1993, p.5).

Process orientation today is most related to organizational thinking highlighting the importance of information technology. The methods used to map and visualize processes are also very similar to the models being used by various information systems and software engineering approaches. This may constitute a problem when broad participation is desirable, as the expressiveness of traditional modeling languages become a barrier when laypersons from many different fields try to use them to map their work processes. When deciding on the suitability of the modeling language to be used, there is a general a tradeoff between expressiveness and formality of the one hand, and the suitability for the active use of the language and the comprehension of models developed in the language by the participant on the other hand (Krogstie, 2001).

Enterprise Modeling (EM) (Fox, 2000; Loucopoulos, 2000) as a holistic concept was first used by the US aircraft industry in the late 80’ies. The term may have been used earlier, but then only to denote any kind of model, ranging from mathematical models to IT architecture models, to data models, geometric models, and even physical mock-up models. The most common kind of enterprise models are process models, showing the transformation from input to output, and the tools, controls and resources necessary to do this. On the other hand enterprise process modeling in particular is not done for one specific goal only, which partly explains the great diversity of
approaches found in literature and practice. Four main categories for enterprise modeling are proposed:

1. Human-sense making and communication: The main purpose of the enterprise modeling is to make sense of aspects of an enterprise and communicate with other people.

2. Computer-assisted analysis: The main purpose of the enterprise modeling is to gain knowledge about the enterprise through simulation or mathematical deduction.

3. Model deployment and activation: The main purpose of enterprise modeling is to integrate the model in an information system and thereby actively take part in the work performed by the organization. Models can be activated in three ways:
   - **Through people** guided by process 'maps', where the system offers no active support or enforcement,
   - **Automatically**, where the system plays an active role in enforcing the 'script', as in most traditional workflow engines.
   - **Interactively**, where the computer and the users co-operate in interpreting the model in the situations that arise. The computer makes decisions about prescribed fragments, while the users resolve ambiguities.

4. The enterprise model is a basis and gives the context for a traditional system development project, without being directly implemented.

An orthogonal dimension to these four are the temporal dimension, i.e. if one are to model the past, the present (as-is) or the future (to-be). Another key differentiator is to what extent the focus is on processes internal to a company, or on inter-organizational co-operation. Finally one can differentiate between process models on a type level and on an instance level.
A number of modeling frameworks have been developed (ARIS, CIMOSA, GRAI, IEM, PERA, GERAM) that provide business process modeling languages allowing description of business processes with various degrees of details and for different points of view on the process itself. Enterprise Modeling (EM) is a capability for externalizing, making and sharing enterprise knowledge. The making and sharing is key to why modeling has value to the enterprise. The model must be more than the sum of individual known views. Enterprise Modeling happens when knowledge workers apply their knowledge and software tools in a creative and purposeful process. The tools can either be used stand-alone to produce various kinds of enterprise knowledge model views, be integrated as front-ends to other systems, or be part of an environment providing a contextual user-environment.

In the ICG case presented in section four, in addition to being a common frame of reference for human sense-making and communication, the process models are also used for model deployment and activation through people, by making process maps available on an intranet. The core of the Modeling Conference method has been adopted from the Search Conference method (Emery & Purser, 1996). The Search Conference is a method for participatory, strategic planning in turbulent and uncertain environments. It has been used in various setting, i.e. community development, organization development, the creation of research initiatives, etc. It has also been done with a number of different designs. The method is however based on the following basic ideas: Open systems thinking, Active adaptation, Genuine democracy and Learning.

The result of a Search Conference is a set of action plans, addressing various challenges that the conference have prioritized, and which people at the conference have committed themselves to implement. The plans may not always be congruent or coordinated, but there is a shared
understanding among the participants on why each of the plans is important for parts of the system.

THE MODELLING CONFERENCE METHOD

The Modeling Conference combines process modeling and search conferences, by doing process modeling in a structured conference environment, promoting broad participation. The argument for participation is primarily based on the social construction view of the organization described briefly in the introduction.

A set of principles lies at the heart of the Modeling Conference. The core of these principles is the ones listed for the Search Conference above, but a few are added due to the special purpose and techniques of the Modeling Conference:

- **Open systems thinking**: The unit of development (organization, community, enterprise) is viewed as an open system, interacting with its environment. At the conference, both the whole system itself and the main parts of the environment should be modeled. The process is always in a context, interlinked with other processes and the rest of the contextual environment.

- **Active adaptation**: A further consequence of the open systems view is that the system needs to adapt to the environment. However, in a turbulent environment, passive adaptation is not enough. The organization needs to influence and interact with its environment, to actively create a context in which it can develop.

- **Genuine democracy**: As in a search conference, the Modeling Conference is based on the assumption that all human actors in a system or process are experts on how the system/process works as seen from their point of view. All local realities are valid and
important in constructing the common model. Given a suitable structure, the participants are jointly able to analyze and understand the situation, and create suitable action plans.

- **Simplicity:** Modeling languages, methods and concepts should be simple so that it is possible for actors with various local realities to express themselves, and thus make real participation possible (Gjersvik & Hepsø, 1998)

- **Pragmatism:** An important issue in the design of the conference is to find a structure and a mix of methods that will work for all participants, and which is useful in order to produce a satisfactory outcome for the actors in the organization (Greenwood & Levin, 1998).

- **The use of the process model as a communicative and reflective device:** The models are, in addition to being the product of the conference, the main device driving the conference process. The use of large physical process visualizations encourages dialogue among the participants within a common frame of reference. (Gjersvik & Hepsø, 1998)

- **Learning:** The conference should create conditions under which the participants can learn from each other, but also from the way they work at the conference. Learning should not be related to the process model, but also related to leading a discussion about the process and to the development of an understanding regarding what constitutes knowledge and truth about the process and the organization. We have used the ideas of triple loop learning (Flood and Romm, 1996), stressing that the conference is only one event in a continuous, multi-level learning process.

The Modeling Conference is performed according to the following rules:
The whole process is performed in one room. All relevant actors in the process should be present or represented in the modeling tasks. In many cases, this also includes outside actors, like users, owners, customers, and governmental and municipal authorities.

The tasks alternate between group work and plenary work.

The participants primarily represent themselves, but are jointly responsible for the content of the conference.

The staff facilitates the work, and is responsible for the method used during the conference.

The modeling language, tools and the overall method must be simple, so that the participants may focus on the content.

The main outcome of the conference is a process model, which names the key processes, products and roles. Additional results are related to this process model.

The following concepts and notations is used:

Process: A series of tasks that produce a specific product.

Product: The result of a process, and in demand by a customer. A process may have several products. We distinguish between end products and intermediate products.

Customer: Someone who demands and uses the product of a process. Often, the customer is another process. For instance, the process "Install technical applications" is a customer of the
process "Draw technical installations", and demands the product "Drawings of technical installations".

The conference preferably lasts one and a half days at least. Every group has a large sheet of paper on the wall, on which they work. All symbols are pre-cut, and can be attached to the sheet of paper. Through these simple symbols and physical way of working together one gets great flexibility and intensive learning, but they also limit the form of work. The results of the group work are presented in plenary sessions for discussion and joint construction of consolidated models.

The documentation from a Modeling Conference is a report and a process model. The most important outcome of the conference is the ownership that the participants develop through the construction process, which makes the model an important common reference for further more detailed development.

The conference agenda is designed so that the actors of the conference should develop models based on their own local reality before they enter a discussion with actors having (presumably) different local realities. We always start with homogenous groups, where people with the same background develop their process models. After this, the participants are more comfortable with the modeling language and tools, and have more self-confidence about their own point of view. This is especially important in organizations where there is a high risk of some groups of actors (i.e. management, experts) having model power over other participants through having a previously developed model available (Bråten, 1973). We subsequently mix the participants in heterogeneous groups, where the whole modeling starts over again.

The difficult part of the agenda is after the second modeling task, where the models of several groups are to be merged into one. This is done in a plenary session. The conference leader needs
to be very attentive to the logic of the different groups, so that he or she is able to combine the
elements from different models into one coherent whole. It is important that this plenary session
is allowed to take the time it needs to obtain a consensus about the model.
This participatory technique has some commonalties with what is found within the field of
Participatory Design (Schuler, 1993), but focuses as we have seem primarily on enterprise
modeling, and not the design of information systems in general.

**CASE STUDY: DEVELOPMENT OF COMMON PROCESS MODEL FOR THE WORK TASKS OF ICG AS A BASIS FOR A NEW INTRANET**

ICG is an engineering consultancy company, with 700 employees. Most of the employees are
found in three major cities in Norway (Oslo, Fredrikstad, and Trondheim), but there are also local
offices spread out throughout Norway, and 100 employees abroad (in Africa and Eastern
Europe). ICG is the result of a merger between three different companies, each a specialist within
an engineering field. The merger was effective at the start of 1999.

**The Knowledge Infrastructure Project and the preparations for the Modeling Conferences**

In 1999, ICG started the development of their Intranet. As opposed to the existing Intranet the
new ICG Intranet was meant to be a real support and coordination in the actual work the
engineers and consultants in ICG do. One of the ambitions in the ICG merger had been to
develop synergy effects through new ways of working across engineering disciplines, and an
understanding of engineering work processes was seen as instrumental to that.

We decided to use the Modeling Conference as the method to construct the processes. In addition
to create a process oriented Intranet, we wanted the project to focus on both organizational and
 technological change. There had to be participation, both to create ownership and in order to take
seriously that this was a social construction process. We wanted to reflect the continuous reconstruction of local and organizational realities, both in the process construction (the modeling conferences) and through an iterative system development process (not to be described in this paper).

The process construction started with a top management meeting, determining the key processes of ICG. This was done through a group discussion, in which the processes were divided into business processes and support processes. The result is shown in Figure 1. The most important outcome from this discussion, was the decision that the process "to initiate, execute and complete a project" (Project Execution) was to be the first process to be constructed and supported by the Intranet. Process owners and change agents were appointed for each process.

![Figure 1: ICG key processes.](image-url)
The Modeling Conferences

We performed four modeling conferences on the Project Execution process: One in each of the three main cities, where people from engineering tended to dominate, and one in which we focused on people from consulting and from smaller, local offices. We would have preferred to mix people more within each conference, but had to take into consideration the costs of the conferences. The participants at each conference were chosen by the process owner and the change agents. We stressed the importance of the project, and that the participants thus should be representative of the whole organization (both experienced and inexperienced, and within various fields.) Although we might have had a better method for this, it worked well in practice, and the conferences (apart from the one in Trondheim\(^2\)) had both a good attendance and a good mix of participants. The process owner and the change agents, assisted by the conference leader, also put together the homogenous groups for the first group work. Mostly, these groups were formed based on skill area.

### Introduction
- Welcome. The goals of the conference and of the Project Execution process. The Process Owner.
- Presentation of the initial model. The Conference Leader.

**Group work 1: Goals for the Project Execution process.**

**Construction of a process model.** (90 min.)
- Homogenous groups.
- Plenary presentation of results.
- Lunch

**Group work 2: Construction of a process model II.** (75 min.)
- Heterogeneous groups.
- Plenary presentation of results.

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\(^1\) The correct word is "mission" (Norwegian: "oppdrag") rather than "project" (Norwegian: "prosjekt"). ICG is being paid to do a mission within a project. The project itself is owned by for instance the building developer. This distinction created a lot of discussion during the construction of the process.

\(^2\) The conference in Trondheim did not have the desired attendance, due to miscommunication and lack of prioritization. Only six people took part, which of course lead to a different kind of conference.
Plenary: Construction of a joint process model.
Group work 3: What information and tools are needed in the sub-processes? (50 min.)
Same groups as in group work 2.
Plenary presentation of results.

Figure 2: Program for the Modeling Conferences in the modeling of the Project Execution process.

Figure 3: Initial model for the Project Execution process.

The program for each conference was pretty similar. The learning we developed from conference to conference was mostly related to the content of the model and the way we managed the discussions. The program for the conferences is shown in Figure 2.

Due to cost considerations, we had to limit the conferences to one workday. This meant that we could not run the modeling conferences the way we originally intended to, where we let the participants create the first model from scratch. We had to give them a head start; thus we designed an initial model of project execution, where the basic steps were included (Figure 3). In the introduction that the conference leader gave to the participants at the opening, the initial model was used to describe the principles of process modeling. They were also told that their task
was to evaluate and validate the model, and preferably to change it completely so that it fitted the way they executed a project.

In the first group work, the participants were also asked to come up with goals for the Project Execution process. The Process Owner gave an introduction to his and ICG's goals at the beginning of the conference, but based on our constructivist view, the goals had to be run through the participative process of the conference before they could acquire meaning for the participants. The conferences went through the two-step process modeling described earlier. At all conferences, there was great enthusiasm and intense group discussions. It was a challenge to get each group to visualize the whole Project Execution process, as some groups got caught up in detailed discussions about a minor part of the process. Managing this was a difficult balance, because it was important to have good discussions about what words and expressions to be used, and what sequence the sub-processes had. The conference leader had an important role here, as he observed all the group discussions, and intervened if the discussions seemed to be stuck on a non-productive issue.

Another challenge was to keep the participants from thinking in terms of screens and user interfaces. Their task was to construct a good process. Once this was done, it was the job of the process group and the systems development group to find ways to create images of this process that could be used on the Intranet.

The most demanding part of the conferences was the construction of a joint process model. Even if we had started out with a common initial model, there were significant dissimilarities between the resulting models of each group after group work 2. These models had to be merged into one model. The Conference Leader started out by asking the plenary whether there were any of the three models that seemed to be a good place to start. We particularly asked whether any of the
models seemed to contain much of what the other two models also had tried to achieve. After finding such a starting point, we gathered all the participants in front of that model. We then picked elements (processes/products) from the other models to replace parts of or add elements to the model we were working on. The Conference Leader also helped the participants question the contents of the model. This made sure that all parts of the process seemed to be covered, that terms and concepts matched, that all products had a process and vice versa, and that the end products made sense in terms of who the customer were.

As the process model was to be used as a basis for the design of an intranet, it was important that the participants also got to say something about what kind of information or tools they required in each sub-process in order to perform good and effective work. We held on to the same heterogeneous groups that we had in group work 2, and divided the sub-processes of the resulting joint process model between the groups. Each group used yellow stickers to attach the required information and tools to the process model on the wall. They could also signal if they required information that had been produced in earlier processes, or produced information that could be used later. This group work did not generate a very systematic input on information and tools, but the sum of the four conferences created valuable input to the further work. Besides, it gave valuable information on what meaning the participants attached to each sub-process in the joint model.

The outcome of each of the modeling conferences was documented in a report, which was distributed to all the participants. Thus they could check that the input they had given to the project was correctly represented.
The final task was to merge the resulting models from the four conferences into one ICG model. This was done at a change agent training seminar, where we gathered the process owners and change agents from all the four prioritized processes in order to give them a basic training in what the project, process thinking and modeling conferences was all about. We put all the processes next to each other on one paper, and asked them to find a common model that would do justice to all the models. The resulting models were rather dissimilar in visual image and complexity. But as one would expect, the main flow of the process was rather similar. This time, the participants were asked to take into consideration that the model needed to fit on a computer screen, and therefore it would be desirable to create several levels of processes, where some processes are sub-processes and other are sub-sub-processes. The resulting top-level model is shown in Figure 4.

![Figure 4: The Process Execution process - final model. (Sub-processes are not shown.)](image-url)
The final model of the Project Execution process was turned over to the process group. They continued the work of making the model consistent and turn the models into an Intranet tool, both with the intention of simplifying work and support the continuous reconstruction of a joint Project Execution process.

EVALUATIONS OF THE RESULTS OF USING THE TECHNIQUE

Two different research projects investigated the use and results of the process models developed through the modeling conferences. Følstad (2000; 2002) used a survey method to map the relationships between direct participation in the modeling conferences, and the dependent variables of acceptance, ownership, and use of the resulting process models. Håkonsen and Carlsen (2000) performed group interviews in a study focusing on communities of practice in ICG.

Følstad's investigation was performed as two surveys, at two different points in time. The first survey was conducted right after the modeling conference, where only the participants of the modeling conference were invited to respond. The second survey was distributed six weeks after the general deployment of the process model to the whole organization. In the second survey, both participants of the modeling conference and other workers in the company were invited to respond, in order to get a broad sample. The respondents of the two groups were matched in regard to work experience and number of years of employment in the company. This was done in order to minimize chances of spurious effects in the between groups analysis.

The surveys included measurements on the three dependent variables:

(1) Acceptance of the model
(2) Ownership of the model

(3) Use of the model.

Acceptance and ownership

Acceptance of the model was defined as the employee's evaluation of the model as an appropriate description of her own work (Følstad, 2002). If the employee regarded the model as a highly appropriate description, the acceptance score should be correspondingly high and vice versa. Ownership of the model was understood as the employee's enthusiasm and feeling of responsibility in regard to the process model. High ownership scores indicates high enthusiasm and feeling of responsibility.

The measurements of the variables were constructed specifically for this task, according to the guidelines of DeVellis (1991). The measurements were based on Likert scale items, ranging from 1 (strongly disagree) to 7 (strongly agree). Negatively phrased questions were transposed. Scores were developed as mean values. The measurement for acceptance included four items in the first survey and six similarly worded items in the second survey. The measurement for ownership included the same four items in both surveys.

Acceptance and ownership of the model was measured in both surveys, but in the first survey the respondents were asked about their acceptance and ownership of the preliminary model developed at the modeling conference they had participated themselves. In the second survey all respondents were asked to state their acceptance and ownership of the Intranet-ready process model, as it had been developed by the process group. Thus it was possible to investigate whether the acceptance and ownership changed as the model was developed further, outside the control of the participants of the modeling conferences.
The results from the first survey, distributed to the participants of the modeling conference only, showed that the respondents had a mean acceptance score of $M=4.8 \ (SD=1.0, \ N=34)$ and a mean ownership score of $M=5.0 \ (SD=1.0, \ N=34)$.

In the second survey ($N=78$), including both participants of the modeling conference ($n=23$) and others ($n=55$), the modeling conference participants had a mean acceptance score of $M=5.4 \ (SD=0.8)$ and a mean ownership score of $M=5.0 \ (SD=1.0)$. The other respondents had a mean acceptance score of $M=4.5 \ (SD=0.9)$ and a mean ownership score of $M=4.6 \ (SD=1.3)$.

Differences in the modeling conference participants' scores on acceptance and ownership across the two surveys were investigated through independent samples T-tests. The acceptance score of the second survey was significantly higher than that of the first survey ($t(50), \ p<0.01$). This implies that the participants of the modeling conference had a higher acceptance for the process model refined by the process group, than they had for the process model developed at the model conference where they participated. There was also found a tendency towards higher ownership scores in the first survey than in the second ($t(38), \ p=0.13$). This tendency was however not significant.

Acceptance and ownership for employees not participating in the modeling conference were measured in the second survey. The mean acceptance score of non-participants was $M=4.5 \ (SD=0.9)$ and the mean ownership score was $M=3.7\ (SD=1.3)$. Differences between modeling conference participants and non-participants were investigated through independent samples T-tests. These found the scores of the non-participants to be significantly lower, both in regard to acceptance, $t(48), \ p<0.00$, and ownership, $t(43), \ p<0.01$. 


On basis of the differences in acceptance and ownership scores between participants and non-participants, it seems that participation in the development of process models, through the use of model conferences generates higher acceptance and ownership. The results also indicates that a process model refined by a process group is accepted as better than the different models generated as the result of each independent modeling conference. However, there is a tendency towards lowered ownership to the models at the end of this process - even though the participants scores higher on ownership than non-participants. This latter tendency may however, be caused by the fact that the second survey was conducted at a later point in time than the first (when more time had elapsed since the modeling conference).

Participation in the Modeling Conferences seems to have a positive effect on the acceptance and use of the process model in two ways: Through the collective reflection and learning processes at the conferences, and through the informal ownership of the end result.

*Use of the model*

Følstad (2000) investigated use of the model both as (1) frequency of use, (2) assumed future use and use of the model and model terms for explanation and presentation purposes. Data on use of the model was collected in the second survey only, since this was conducted six weeks after deployment of the model in the company Intranet. Frequency of use was collected by the use of categories (<every second week, every second week, every week, several times a week, daily). Assumed future use and use for explanation and presentation was measured through 5 Likert-scale items developed particularly for the investigation.

The self reported frequency of use (after 2 - 3 months) was generally low, approximately once a week per user. This holds for both participants and non-participants of the modeling conference.
This low frequency of use may have been because few new projects had been started during that period along with the fact that the investigation was conducted only six weeks after deployment. However, the participants scored significantly higher on the measures of future use and use for presentation and explanation than the non-participants. This was evident in an independent samples T-test comparing the mean scores of the participants \((M=4.0)\) and non-participants. The participants \((M=3.3)\) \((t(40)=2.3, p<0.05 (one-tailed))\).

Even if the low self-reported use of the model might seem discouraging, this pattern is often found in connection to introducing new methodology also in the IS Field (Krogstie, 2000). You do not change your methodology in the middle of a project, and Håkonsen & Carlsen (2000) also argue that use must be understood in a much broader sense. The process model on the Intranet is not only used to retrieve information. Through terminology development, it contributes to the establishing of a new and common understanding of one’s own work. The model is also used in communication with customers, to explain how ICG work in projects, which may indicate that the actors identify with the process.

As for validity and generalizability of the results, we note that the results are according to the research hypothesis. They are also according to existing theory in the area, and the results and interpretations are discussed with the workers involved, and with other researchers being familiar with the organization. The findings may be summed up as in Figure 5:
Figure 5: The effect of Participation on the Establishment and Use of the model, with the associated variables Need and Ownership. Single arrows indicate causal relationships. Double arrows indicate mutual influence. (Følstad, 2000, p.66)

Group interview

In their interviews, Håkonsen & Carlsen (2000) found that the process model is perceived as very good, in the sense that it gives a good description of project execution, and functions well as a tool for planning and starting projects. The model is considered relatively more useful for small branch offices and inexperienced project managers. It is seen as a supplement to information stored locally, and to traditional methods for information retrieval and knowledge transfer.

We think that the research results indicate that the Modeling Conference is an interesting method for developing process models, and that both the method and the models can support the development of encultured, embedded and encoded knowledge. Both the participants' ownership and the ways the visualizations on the Intranet are being used tend to improve the information retrieval, the coordination and the knowledge reactivation in ICG. Both Modeling Conferences
and the Intranet implementation do of course have to be seen in relationship to other development activities.

**DISCUSSION**

We have used the Modeling Conference in many different organizational settings including hospitals, banking, the building industry, universities and the power industry.

In the ICG case, we developed an initial process model in order to speed up the conference process. On the one hand, this may introduce unnecessary structuring to the conference, with the risk of the conference leader and process owner having too much model power. On the other hand, we have experienced that the participants often feel bewildered about the symbols and the work method unless they have an example. This example does of course not have to be a model of the problem to be attacked. We still think that a conference that starts from scratch is the best solution, but in that case, it is vital that one has enough time (at least two days), so that the participants can become comfortable with the method and concepts. We suggest that it may be an interesting research topic to investigate how the use of an initial model influences the result and ownership of the models being produced.

One observation we have made is that some Modeling Conferences tend to be conservative. As the participants look for the common denominator in their different models, it is sometimes hard to introduce radically new ways of thinking about the process. First, this may not be a problem. The model will develop through use, and as long as we create organizational learning loops, and this learning can be taken into account, the new elements will be built into the model. What is important at the conference is the common ownership. Second, radical ideas for redesign are often already present among the participants. If they do not come up during the conference, it is
usually a problem of the defensive routines (Argyris & Schön, 1978) of the organization itself. It is however a challenge to facilitate the conference in such a way as to break these defenses.

We have considered introducing short talks to the conference, where some kind of expert was given the possibility to draw up their visions for the process. This may be a good idea as long as it is being taken as one point of view, and given the same validity as all other voices at the conference. However, we think that it will be even more powerful if the participants came up with the ideas themselves. We will do this in some future conferences through introducing group tasks to the conference where we challenge the participants to be more visionary and radical in their approach to the process.

Choosing the conference participants is difficult. The idea is that the whole process should be in the conference room. This implies that all the work operations in the process should be represented, in addition to representatives of customers, suppliers, and other parts of the environment. This is not difficult in cases where the number of actors is so low that all may participate. When a selection has to be made, the choices about how to choose and who should choose are not straightforward. We have often created a project team, where we try to include representatives of all major actor groups, and have this group make the selection. In knowledge intensive companies, where most employees are professionals, this is not very difficult, because the local realities that we want to have represented are more based on profession than on class, union, etc. In more traditional industrial organizations, things are more difficult. No matter which organization or process, we do however stress the importance of having a clear understanding of the method, as the selection is a key part of the participatory process.

In the ICG case, the number of participants at each conference was between 15 and 25. We have managed to run conferences with up to 50 participants, but this requires quite a lot of time (as
each group must be allowed to present their work after each group session). We have found that 12 to 15 participants are the lower limit, as it is useful to have at least three groups in order to have requisite variety.

A lot of the success of the conference depends on the conference leader. On the one hand he or she is necessary to maintain the structure and progress, to explain the method, and most importantly, to assist the participants in constructing the common process model. On the other hand, the conference leader should be almost invisible, in the sense that he or she is not responsible for the content and the result of the discussions.

As Gjersvik and Hepsø (1998) have discussed earlier, it is important that the model created is used as a basis for an Intranet or other work tools. This prevents that the conference ends up as a stand-alone event, without any subsequent action. What we aim for is embedded, encoded and encultured organizational knowledge (Blackler, 1995). In order to obtain this, the model must be enacted in everyday work. Of course, there is no guarantee that a process model developed through a Modeling Conference and implemented on an Intranet will constitute knowledge that is reactivated in organizational work.

The modeling language used is deliberately very simple compared to most other process-modeling languages to enable broad participation. Since the models are meant for human-sense making and communication and manual activation (through people) this might not be problematic. Experiences from other projects (Dalberg et al, 2003) has made it clear that if one are to use process models as a basis for traditional systems development, what appears to be agreed on a high level process model hides a lot of possible disagreement on a lower level. Thus, when using process modeling as a basis for analysis, automatic activation or context for systems development, a more comprehensive modeling language might be called for.
CONCLUSIONS AND FURTHER WORK

The research results from ICG do indicate that the Project Execution process is being used, both as a direct work tool and in the broader sense as part of the organizational language. The results do however point out that training and implementation also are important when it comes to reactivation of knowledge. In other cases where we have done a Modeling Conference without linking it with technology development, the participants have stated that the conference in itself has been important for the organization. It gave all actors a chance to discuss their work in a structured and participatory way. This is probably very useful for most organizations, but it limits the organizational learning to issues of how to communicate about their work, and who has the right to participate. We will in continued use of the technique investigate further the appropriateness of using the techniques and describe variants for different types of process modeling and knowledge representation tasks.

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