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Using EKD-CMM Electronic Guide Book for Managing Change in Organisations

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Abstract. *The assumption of the work presented in this paper is the situatedness of the change process. The Enterprise Knowledge Development - Change Management Method (EKD-CMM) provides multiple and dynamically constructed ways of working to organise and to guide the change management. The method is built on the notion of labelled graph of intentions and strategies called a road map and the associated guidelines. The EKD-CMM road map is a navigational structure which supports the dynamic selection of the intention to be achieved next and the appropriate strategy to achieve it whereas guidelines help in the operationalisation of the selected intention. This paper presents the electronic guide book which implements the EKD-CMM road map and its associated guidelines.*

1. Introduction

Enterprises are facing increasing pressures and competitiveness. In this context, achieving organisational transformation depends of the creation of a powerful vision of what future should be like [1]. The work presented in this paper addresses the organisational change management method applied in the ESPRIT project ELEKTRA¹. The so-called Enterprise Knowledge Development - Change Management Method (EKD-CMM) provides a systematic way to organise and to guide the change management. EKD-CMM is a method to documenting an enterprise, its objectives, business processes and support systems, helping enterprises to consciously develop schemes for implementing changes. Contemporary enterprises are highly complex distributed systems having many purposes and customers and involving many actors, technologies and business processes.

Enterprises that can manage complexity and can respond to rapid change in an informed manner can gain a competitive advantage. The purpose of the EKD-CMM is to provide a framework for considering how the enterprise functions currently, what are the requirements for change and the reasons for change, what alternatives could be envisaged in order to meet these requirements, and what are the criteria and arguments for evaluating these alternatives.

According to Seligmann [22], a method is composed of a way of thinking, a way of modelling and a way of working. The way of working describes the modelling process to be followed by application engineers. Work in this area mainly focus on prescriptive approaches. However, due to its social and innovative nature, the organisational change can not be fully prescribed. In fact, the change process is a decision making process, i.e. a non deterministic process. Accordingly, a method for organisational change management should allow to select dynamically the next task to be performed depending on the situation at hand [4], [17], [18], [19], [20].

EKD-CMM satisfies two requirements : (i) assisting Enterprise Knowledge Modelling

¹ This work is partially supported by the ESPRIT project ELEKTRA (N°22927) funded the by the EC in the context of the Framework IV program

and (ii) guiding the change process. Enterprise Knowledge Modelling refers to a set of conceptual models for describing various aspects of organisations [7], [12], [13], [14], [16] including enterprise business processes (roles, actors, activities, objects,...) and enterprise objectives [2], [9]. Process support in EKD-CMM is based on a road map which is a *navigational structure* in the sense that it allows the change engineer to determine a route from *Start* intention to *Stop* intention. The approach suggests a dynamic construction of the most appropriate route by navigating in the road map. Thus, EKD-CMM proposes several ways of working, and in this sense, it is a multi-method.

This paper is organised as follows. Section 2 defines the way of thinking, the way of modelling and multiple ways of working of the EKD Change Management Method. Section 3 introduces the electronic guide book that has been developed to guide managers and EKD-CMM engineers involved in the change process management to organise this process.

2. The EKD change management method

EKD-CMM provides a systematic approach to develop and document enterprise knowledge, to help organisations to develop models for implementing changes. Its way of thinking, way of modelling and multiple ways of working are developed in sub-sections 2.1, 2.2 and 2.3, respectively.

2.1. The EKD-CMM way of thinking

The need for change is typically stated in a simple manner as a change vision. A classical example is John F. Kennedy's statement: '*to send a man to the moon before the end of the decade*'. Thus, the change process is the process of transforming the vision into a new model. Within the world in which the vision has to be realised, many habits (legacies) exist. Some are based on formally stated goals, policies, or competing visions. Others are just regularly observable phenomena for which no predefined structure or reasons are known a priori.

The task is therefore twofold. First, relevant habits must be analysed and the goals, policies and visions behind them must be made explicit. This is essentially a goal-driven abstraction process from existing practice leading to the 'As-Is' model which defines the functionality and history of the existing organisation. Second, the new vision must be established as a mission in this context leading to the 'To-Be' model which defines the requirements for the envisioned organisation. The quality of the As-Is and To-Be models depends on the knowledge elicited from the stakeholders and their involvement in the change process. According to Jackson [5] the first model describes indicative properties whereas the second one describes optative properties. As depicted in figure 1, mastering the change in an organisation requires four major steps.

1 - *Reverse analysis* : Abstracting a model from current reality (As-Is model). In most cases, no conceptual model of the actual organisation exists.

2- *Change definition* : Integrating the change definition into the As-Is model defining the model for the future organisation (To-Be model).

3 - *Change implementation* : Implementing the new organisation based on the To-Be model.

4 - *Legacy integration* : Taking into account the existing context during the change implementation.

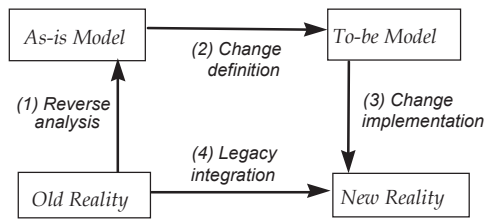


Figure 1. The EKD-CMM view of the organisational change

Noticing this necessary juxtaposition of vision and context in an always changing environment, we define the change process as a process of establishing a vision for change in context. The change definition (step 2 in figure 1) is itself a complex process as many alternative change routes and many future models can be envisioned. Thus, EKD-CMM suggests two more tasks consisting of first, modelling the alternative scenaria for change within a change process model and secondly, selecting the appropriate scenario for change.

The EKD-CMM conceptual support for change consists in reasoning on models. Thus, the EKD-CMM process results in three models (the As-Is model, the To-Be model and the Change Process model) and identifies four states to be reached when performing change management. We refer to those as the four EKD-CMM states:

- (1) 'As-Is' state ;
- (2) 'Alternative scenaria for change determined' state ;
- (3) 'Alternative scenaria evaluated and the most appropriate one selected' state ;
- (4) 'To-Be' state.

EKD-CMM does not impose one way of reaching the four states but proposes several ones. In other words, there are several routes that can be followed to reach the four EKD-CMM states required for managing change. These routes are integrated in the EKD-CMM road map.

2.2. The EKD-CMM way of modelling

The models underlying EKD-CMM are based on the use of Enterprise Models [2] which purpose is to represent various views of an enterprise. A detailed presentation of the EKD-CMM Models can be found in [3] and [8].

The inter-connected set of EKD-CMM models describing an enterprise can be visualised in three levels of concern as shown in figure 2: *Enterprise Goal Model*, *Enterprise Business Process Model* and *Enterprise Information System Model*. The first one describes the enterprise objectives and the second one describes various aspects of enterprise processes. The third is used when the EKD approach is applied to define the requirements for an information system. The focus is thus the computerised system which has to support the goals, the processes and the actors of the enterprise as defined in the previous models. The EKD-CMM electronic guide book presented in this paper concerns the two first levels of modelling, enterprise objectives and enterprise business processes.

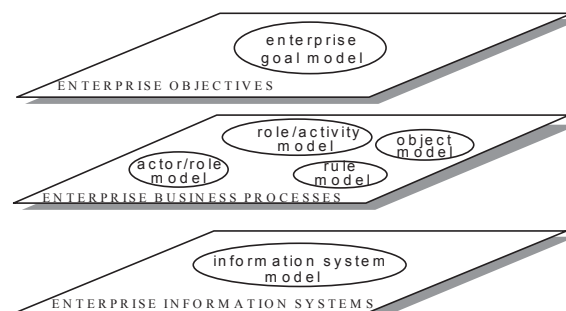


Figure 2. EKD-CMM models

Enterprises form networks of related processes in order to meet their *objectives*. Strategic goals set the direction and purpose of the enterprise. The purpose of the *enterprise goal model* is to describe what the enterprise wants to achieve or to avoid.

Enterprise business processes motivated by enterprise objectives should be modelled according to several points of view : (a) What happens in enterprise processes can be analysed in terms of the *roles* that individuals or groups play in order to meet their responsibilities. Roles correspond to sets of responsibilities and related activities. The *actor/role model* aims to describe how actors are related to each other and also to enterprise objectives. (b) People *perform activities* to achieve enterprise objectives. The *role/activity model* is used to define enterprise processes, the way they consume/produce resources to achieve enterprise objectives. (c) Activities carried out by different roles deal with business *objects*. Business objects set the structure of the support systems and their behaviour has an identifiable life-cycle. The *object model* is used to define the enterprise entities, attributes and relationships. (d) Enterprise processes run according to *business rules*. Business rules are the way that enterprises function. The *business rules model* is used to define business rules, defining the way that the enterprise functions, consistent with the goals model.

2.3. A road map defining multiple ways of working of EKD-CMM

A road map is a process model in which a non-deterministic ordering of intentions and strategies has been included. It is a labelled directed graph with intentions as nodes and strategies as edges between intentions. The directed nature of the graph shows which intentions can follow which one. A map consists of a number of *sections* each of which is a triplet $\langle P_i, I_j, S_{ij}^3 \rangle$. There are two distinct intentions called *Start* and *Stop* respectively that represent the intentions to start navigating in the map and to stop doing so. Thus, it can be seen that there are a number of routes in the graph from *Start* to *Stop*. The road map is a *navigational structure* which supports the dynamic selection of the intention to be achieved next and the appropriate strategy to achieve it whereas the associated guidelines help in the operationalisation of the selected intention.

We assume change processes to be intention-oriented. At any moment, the change engineer has an *intention*, a goal in mind that he/she wants to fulfil. To take this characteristic into account, the road map identifies the set of intentions that have to be achieved in order to solve the problem at hand. There are two key intentions in EKD-CMM, namely “*Conceptualise Enterprise Business Process Model*” and “*Elicit Enterprise Goal Structure*”. We refer to them as ‘Process Intentions’. “*Conceptualise Enterprise Business Process Model*” refers to all activities required to construct a business process model whereas “*Elicit Enterprise Goal Structure*” refers to all those activities that are needed to identify goals and to relate them one another through AND, OR (exclusive OR) and AND/OR (inclusive OR) relationships. The two first are traditionally used in goal modelling [10]. The AND/OR relationship is required in order to make possible the expression of a multiple choice between several options.

A *strategy* is an approach, a manner to achieve an intention. The strategy, as part of the triplet $\langle I_i, I_j, S_{ij} \rangle$ characterises the flow from I_i to I_j and the way I_j can be achieved. Six strategies are used in the road map for organisational change, namely Participative Modelling Strategy, Analyst Driven Strategy, Process Clustering Strategy, Goal Deployment Strategy, Evaluation Strategy and Completeness Strategy.

² Intention are in *italics* (I_i, I_j)

³ Strategies are in arial narrow (S_{ij})

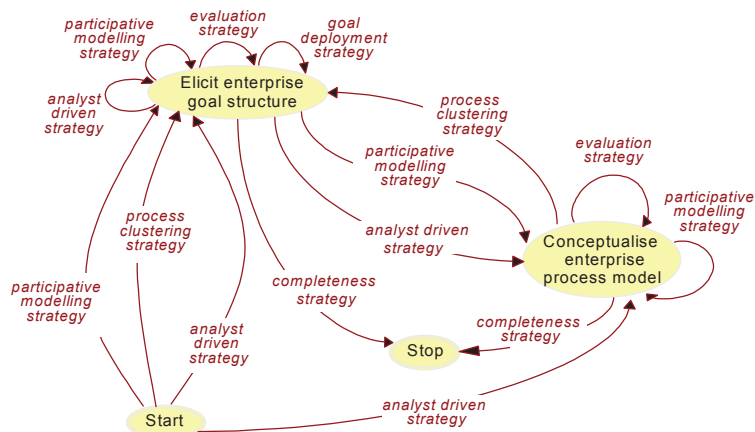


Figure 3. The road map

The specific manner in which an intention can be achieved is captured in a section of the map whereas the various sections having the same intention I_i as a source and I_j as target show the different strategies that can be adopted for achieving I_j when coming from I_i . The EKD-CMM road map is shown in figure 3. As shown in this figure, there might be several flows from “Start” (I_i) to “Elicit Enterprise Goal Structure” (I_j), each corresponding to a specific strategy (for example $\langle \text{Start, Elicit Enterprise Goal Structure, Participative Modelling Strategy} \rangle$ and $\langle \text{Start, Elicit Enterprise Goal Structure, Analyst Driven Strategy} \rangle$). In this sense the map offers *multi-thread flows*. There might also be several strategies from different intentions to reach an intention I_i (for example $\langle \text{Elicit Enterprise Goal Structure, Elicit Enterprise Goal Structure, Goal Deployment Strategy} \rangle$ and $\langle \text{Start, Elicit Enterprise Goal Structure, Participative Modelling Strategy} \rangle$). In this sense the map offers *multi-flow paths* to achieve an intention. Finally, the map can include reflexive flows, for instance $\langle \text{Elicit Enterprise Goal Structure, Elicit Enterprise Goal Structure, Goal Deployment Strategy} \rangle$ in figure 3.

The road map contains a finite number of routes, each of them prescribing a way to develop the product -a way of working-, i.e. each of them is a EKD-CMM process model. Therefore the map is a *multi-model*. It embodies several process models, providing a multi-model view for modelling a class of EKD-CMM processes. None of the finite set of models included in the road map is recommended ‘a priori’. Instead the approach suggests a dynamic construction of the actual path by navigating in the road map.

Because the next intention and strategy to achieve it are selected dynamically, guidelines that make available all choices open to handle a given situation are of great convenience. The EKD-CMM road map has such associated guidelines. A guideline is a set of indications on how to proceed to achieve an intention. A guideline embodies *method knowledge* to guide the change engineer in achieving an intention in a given situation. EKD-CMM guidelines are provided for each section of the road map to support the achievement of an intention following a given strategy. Some of them will be described in section 3.

3. The electronic guide book

3.1. The electronic guide book structure

In this sub-section, we deal with the electronic guide book and guideline structure. We first introduce the structure of the guide book and show how a goal hierarchy helps organising its contents. We then, move to the structure and typology of guidelines. In sub-

section 3.2, we will describe the electronic guide book contents itself and its use.

3.1.1. A hierarchy of usage intentions

The main objective of the EKD-CMM electronic guide book is to guide the selection and application of a route in the EKD-CMM road map. To this end, it guides the engineer involved in change management to select the route appropriate to the situation at hand ; it helps him/her to select the task to be executed next in this route; and it guides the task performance by the means of guidelines associated to the traversed map sections. However, the electronic guide book provides knowledge not only to guide stakeholders involved in the change process, but also to understand EKD-CMM framework. The hierarchy of usage intentions shown in this figure represents the indexing of the EKD-CMM knowledge base as a goal graph. Thus, as shown in figure 4 the EKD-CMM electronic guide book comprises three main parts which are identified by the three usage intentions: *Understand the Use of the EKD-CMM Electronic Guide Book*, *Understand EKD-CMM Change Management Framework* and *Apply EKD-CMM*.

- The first part, called *Understand the Use of the EKD-CMM Electronic Guide Book*, describes the navigation in the guide book which can be performed in two ways :
 - using the EKD-CMM electronic guide book usage intentions hierarchy (see figure 4), or
 - step by step selecting one of the three main entry points (see figure 5) and then browsing page to page using the arrow buttons : the up-arrow to move to the previous level in the intention hierarchy, the right-arrow to move to the next intention at the same level in the intention hierarchy, and the left-arrow to move to the previous intention at the same level.

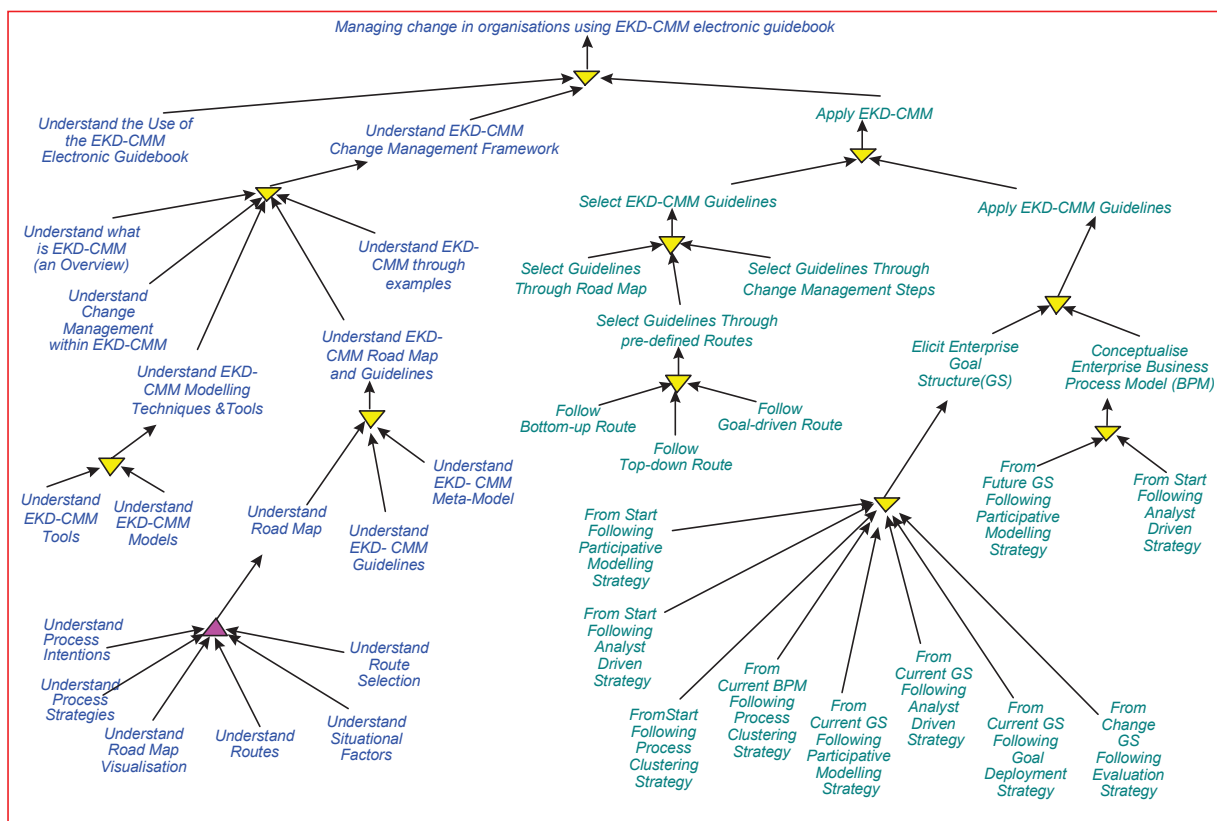


Figure 4 : The hierarchy of usage intentions of the EKD-CMM electronic guide book

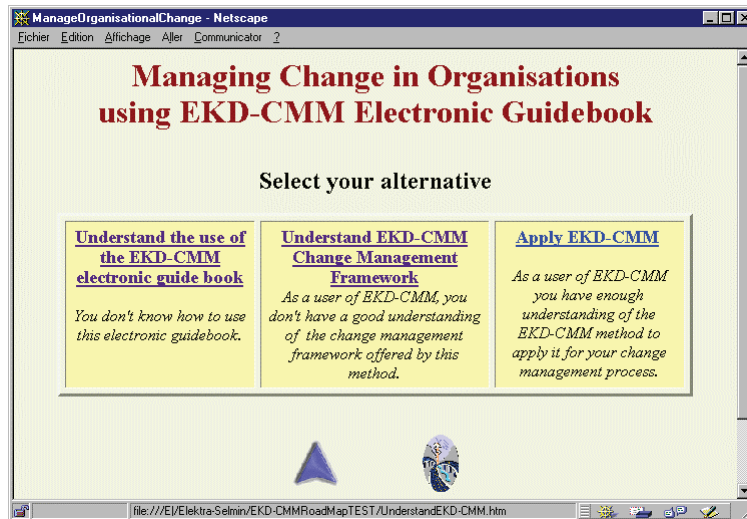


Figure 5. The step by step navigation in the EKD-CMM electronic guide book

- The second part, called *Understand EKD-CMM Change Management Framework*, explains the EKD-CMM way of thinking, introduces the various components of the EKD-CMM way of modelling (models and tools), and describes the different ways of working for managing the organisational change using EKD-CMM by the means of the EKD-CMM road map and its associated guidelines.
- The third part, called *Apply EKD-CMM*, provides multiple ways of applying EKD-CMM and gives access to guidelines supporting the map sections of the road map.

3.1.2. Typology of guidelines

Following [21] we consider a method as being composed of a set of guidelines. In the context of EKD-CMM, a guideline suggests how to progress at a given point of the EKD-CMM process, how to fulfil a modelling intention that an EKD-CMM user may have. A guideline might be looked upon as a structured module of knowledge for supporting decision making in the EKD-CMM process.

According to the contextual formalism developed within the ESPRIT project NATURE [20], we propose to describe a guideline using the concept of *context*. A context is defined as a pair $\langle \text{situation}, \text{intention} \rangle$. A *situation* is a part of the product it makes sense to make a decision on. It indicates when the guideline can be applied. What we mean here by product refers to the different EKD-CMM models. At the beginning of the EKD-CMM process the situation can be a problem statement, in other words some guidelines can be used 'from scratch'. An *intention* represents a goal a the change engineer wants to fulfil at a given point in time when he/she uses the EKD-CMM method for managing change in organisations.

The result expected of fulfilment of a EKD-CMM modelling intention is the *target* of the guideline associated to the map section leading to this intention following a given strategy. This result is described using one of the EKD-CMM models (see figure 6).

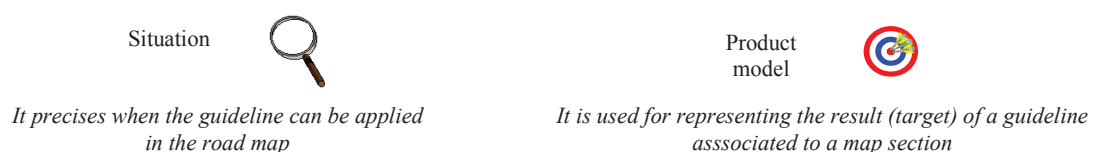


Figure 6. Symbols used in the description of EKD-CMM guidelines

For example, the guideline $\langle(Goal), Reduce\ goal\rangle$ considers a goal in the goal model as the situation and *Reduce goal* as the intention. In this case, what the EKD-CMM user wants to achieve is to decompose or to refine the goal of the situation into more specific goals. A guideline has a body that describes how to fulfil the intention. The guideline mentioned above describes a set of different strategies for reducing a goal (e.g. using a case driven strategy, an actor driven strategy, etc.) and provides means for the selection of the most appropriate strategy. All the EKD-CMM guidelines available in the electronic guide book are described with respect to the following template:

<p><i>Name of the guideline:</i> It expresses a process intention</p> <p><i>Description of the guideline:</i> It provides a summary of the content of the guideline</p> <p><i>Body of the guideline:</i> It tells how to achieve the intention by providing steps, choices, activities to be performed and the related concepts to be used.</p> <p><i>Situation:</i> It describes when the guideline can be applied.</p> <p><i>Product model:</i> It refers to one of the EKD-CMM models.</p>

EKD-CMM guidelines are organised into hierarchies. Links between guidelines are of two kinds: refinement links allowing the refinement of a large-grained guideline into finer ones and composition links for the decomposition of a guideline into component guidelines. Guidelines are of three types, namely *choice*, *plan* and *executable*. The EKD-CMM method knowledge is defined as a hierarchy of guidelines having executable ones as leaves of this hierarchy. Browsing this hierarchy, the change engineer obtains more and more fine grained guidance.

When progressing in the EKD-CMM process, the change engineer may have several alternative ways to solve an issue. Therefore, he/she has to select the most appropriate one among the set of possible choices. In order to model such a piece of EKD-CMM process knowledge, we use the first type of guideline, namely the choice guideline. The body of a *Choice Guideline* offers different alternative ways for achieving the process intention. For example, *Construct Change Goal Hierarchy* is a choice guideline (figure 7) introducing two alternatives to the construction of the change goal hierarchy (an enterprise goal model). Arguments (in italics in figure 7) are provided to help in the selection of the most appropriate alternative. For example, *Construct Change Goal Hierarchy following One Shot Tactics* is the right decision to make when the stakeholders that will be involved in the definition of the change goal hierarchy are aware of both what should be changed in the current functioning of the enterprise as well what should be introduced.

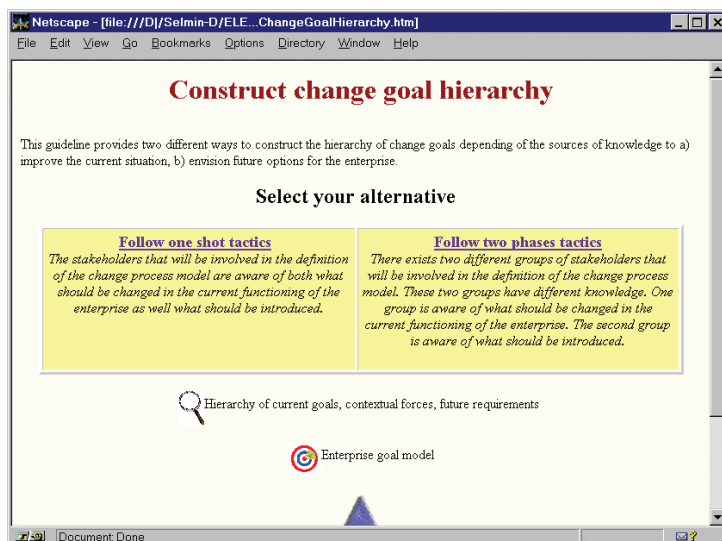


Figure 7. An example of choice guideline *Construct Change Goal Hierarchy*

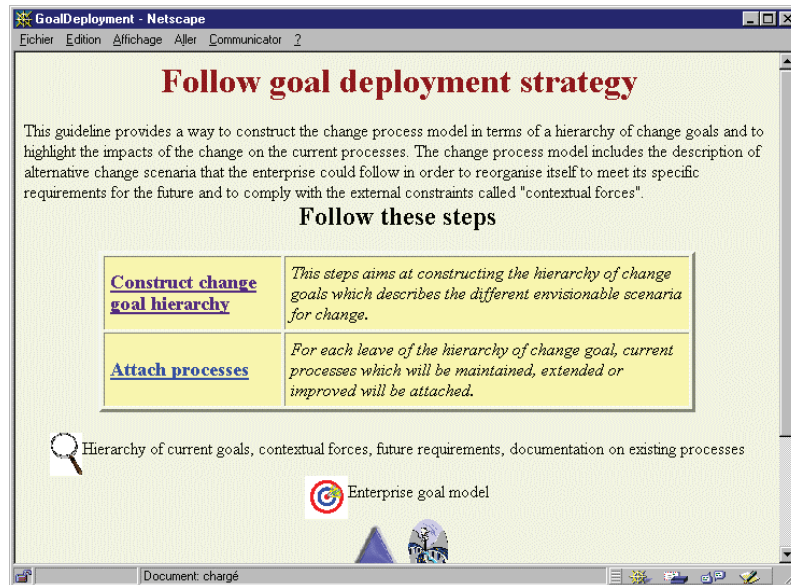


Figure 8. An example of plan guideline : *Elicit Change Goal Structure* from *Current Goal Structure* following Goal Deployment Strategy

It is important to notice that the alternatives of a choice guideline are guidelines too. For instance, the second alternative guideline, namely *Construct Change Goal Hierarchy following Two Phases Tactics*, is a plan guideline that will be presented in detail in section 3.2.3 (figure 16).

In order to represent situations requiring a set of decisions to be made for fulfilling a certain intention, the EKD-CMM process modelling formalism includes a second type of guideline called *Plan Guideline*. A plan guideline can be looked as dealing with a macro issue which is decomposed into sub-issues, each of which corresponds to a sub-decision. Components of a plan guideline are also guidelines. For example, the guideline associated to the map section *<Elicit Enterprise Goal Structure, Elicit Enterprise Goal Structure, Goal Deployment Strategy>* is a plan guideline composed of two component guidelines, namely *Construct change goals hierarchy*, and *Attach processes*. This means that, when using the goal deployment strategy, the change engineer has first to construct the hierarchy of change goals supported by the guideline shown in figure 7 and then to attach processes to the leaves of this hierarchy as shown in figure 8.

An *Executable Guideline* corresponds to an operationalisable intention which is directly applicable through a set of activities. The body of an executable guideline proposes a set of activities to be performed for achieving its process intention. For instance, the guideline associated to the map section *<Elicit Enterprise Goal Structure, Elicit Enterprise Goal Structure, Analyst Driven Strategy>* suggests to perform the activities described in figure 9.

Any guideline in the electronic guide book is referred to by its name i.e. the intention part of the context the guideline is associated to.

3.2. The electronic guide book contents

In this section we illustrate the following intentions: *Understand EKD-CMM Change Management Framework*, *Select EKD-CMM guidelines* and *Apply EKD-CMM guidelines*.

Activity	Techniques and tools	Comments
Capture Goals list	Top managers and/or domain experts interview, Group System (Brainstorming or Topic Commenter)	An initial list of goals has to be acquired either through interviews or during a brainstorming session.
Improve Goals list	Group System (Categorizer)	The initial list of goals resulting from the previous activity may be improved. This list may contain redundancies, inconsistencies, fuzzynesses, etc. or partially overlapping goals that should be corrected. This activity shall be performed in different ways, through electronic discussions based on annotations of goals, by categorizing goals co-operatively and through open discussions.
Prioritise Goals	Group System (Voting)	It might be appropriate to rank the different goals and eliminate those that are considered as unimportant.
Organise Goals list into hierarchy	Group System (Group outliner)	The list of selected goals can be hierarchically organised using for example the Group Outliner facility provided by Group System.

Figure 9. An example of executable guideline : *Elicit Future Requirements from Current Goal Structure* following Analyst Driven Strategy

3.2.1. Understand EKD-CMM change management framework

The page of the guide book shown in figure 10 aims to help the change engineer to understand the EKD-CMM change management framework.

This page provides links to other pages which develop the EKD-CMM way of thinking (*Understand Change Management within EKD-CMM*), the EKD-CMM way of modelling (*Understand EKD-CMM Modelling Techniques and Tools*) and its multiple ways of working (*Understand EKD-CMM Road Map and Guidelines*). As shown in figure 4, the EKD-CMM road map and its embedded intentions and strategies are described in the pages of the guide book indexed by the following intentions, *Understand Road Map Visualisation*, *Understand Process Intentions* and *Understand Process Strategies* respectively. Examples of routes that have been implemented in the electronic guide book and their selection are also described (*Understand Routes*, *Understand Route Selection*). The selection of a route appropriate to the situation at hand for a change management process is facilitated by the use of situational factors (*Understand Situational Factors*).

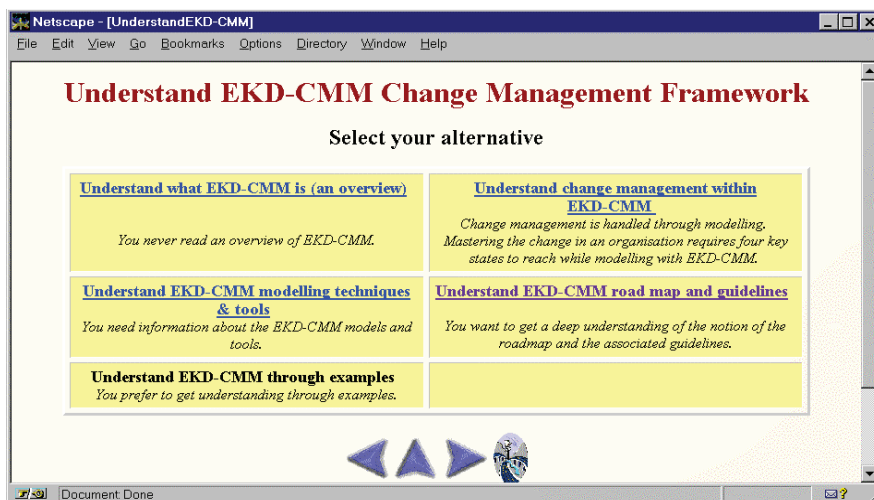


Figure 10. Navigation in the second part of the EKD-CMM electronic guide book

3.2.2. Select EKD-CMM guidelines

The first sub-branch of the *Apply EKD-CMM* part of the electronic guide book, called *Select EKD-CMM guidelines*, offers three **guided** ways to select the guideline the change engineer has to apply next: through the EKD-CMM road map, through a step in a route or through change management steps.

- (i) As we have already introduced, the EKD-CMM road map (see figure 3) proposes flows to navigate from one intention to another using given strategies. One way of progressing in the change management process is to select the intention to perform next, and to select one of the possible strategies (if several) to flow to this intention. *Select guidelines through road map* intention of the indexing hierarchy allows the change engineer to identify the guideline supporting the achievement of the intention he/she wants to fulfil based on the EKD-CMM road map. Based on this decision, the associated guideline can be identified using (and triggered through) the list of figure 11.
- (ii) *Select guidelines through pre-defined routes*, allows the change engineer to visualise the steps of the three routes implemented in the EKD-CMM electronic guide book. Their stepwise description shall be considered as reminders of these routes. There might be used during an EKD-CMM project, to visualise the route which is followed. If the change engineer decides to apply the EKD-CMM guidelines by selecting them through an example of a pre-defined route, he/she should first choose the route as shown in figure 12.

Let us suppose that in the situation at hand, the organisational maturity of modelling and the degree participative involvement are low, the organisational culture is hierarchical, and the external pressures are known. Therefore, the change engineer decides to follow the bottom-up route (see figure 13).



Figure 11. Applying EKD-CMM by selecting guidelines through the road map

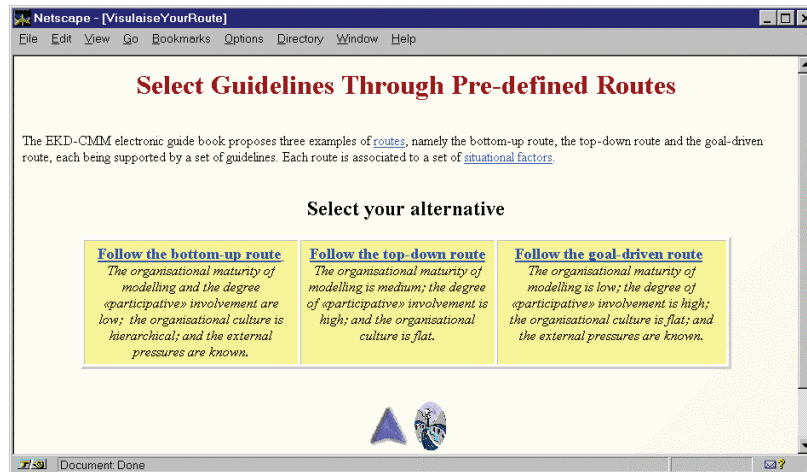


Figure 12. Three examples of routes implemented in the EKD-CMM electronic guide book

The selection of the step to carry out next in the route identifies the guideline (the corresponding hypertext link) which supports this step as shown in figure 13.

(iii) *Select guidelines through change management steps* allows the change engineer to identify the guideline to be followed according to the change management step he/she wants to carry out. Figure 14 shows the page of the guide book indexed by the usage intention *Select guidelines through change management steps*.

Thus, the *Select EKD-CMM guidelines* sub-branch of the intention hierarchy allows the change engineer, first to decide in which manner he/she wants to be guided, second to select the methodological guideline he/she has to apply next in a guided way, and third to apply it using the corresponding hypertext link embedded in the page of the guide book chosen in the first step (figures 11, 13 and 14).

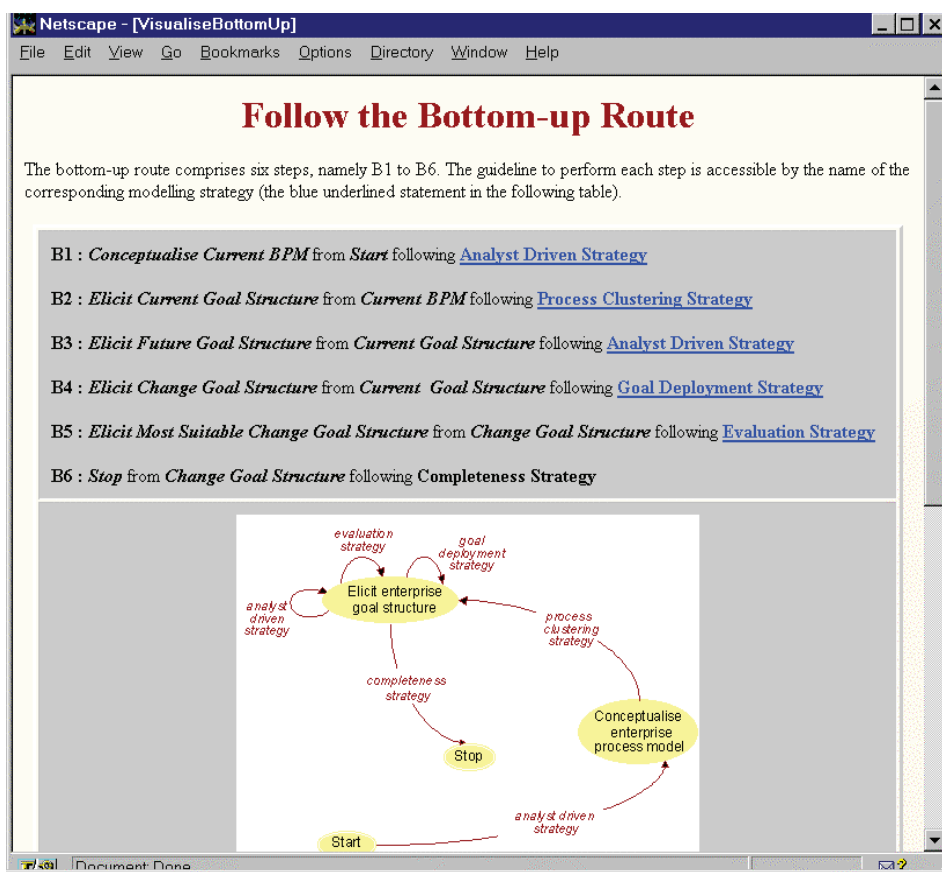


Figure 13. Applying EKD-CMM by selecting guidelines through the 'bottom-up route'

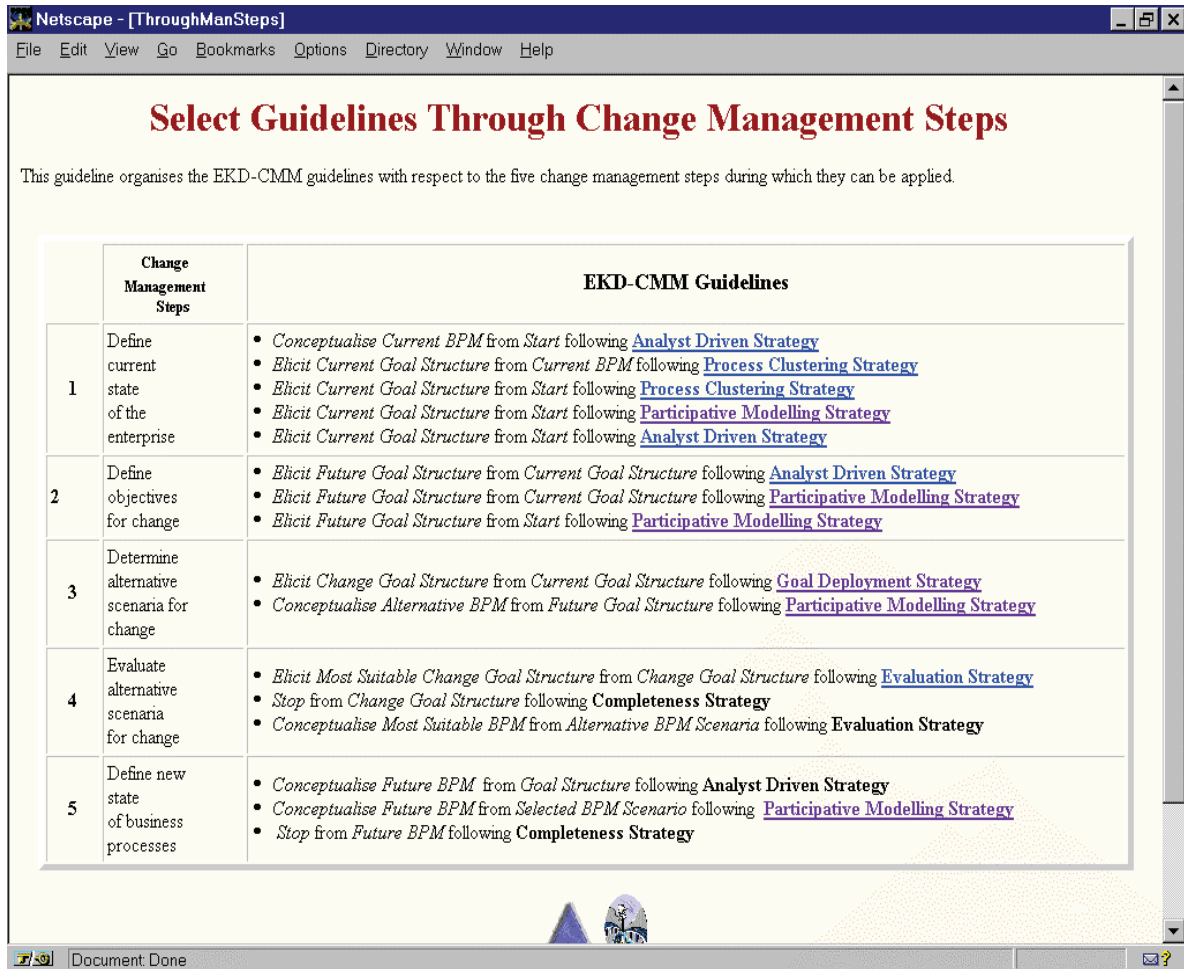


Figure 14. Applying EKD-CMM by selecting guidelines through change management steps

3.2.3. Apply EKD-CMM guidelines

The second sub-branch of the *Apply EKD-CMM* part of the electronic guide book, called *Apply EKD-CMM guidelines*, is suitable if the change engineer is knowledgeable enough of what he wants to do next in order to select the guideline to be applied next *directly*. This sub-branch contains the EKD-CMM available guidelines. There is one guideline to be applied for each map section of the road map (see figures 3 and 10). The page of the guide book indexed by the intention *Apply EKD-CMM guidelines* offers choices with arguments to help in the selection of the appropriate alternative (see figure 15).

The participative modelling strategy seems appropriate in the situations where the organisational maturity of modelling and the participative involvement are high, the organisational culture is flat and the degree of clarity of the problem is low. The guideline implementing this strategy is than suggested for map sections <*Start, Elicit Enterprise Goal Structure, Participative Modelling Strategy*> and <*Elicit Enterprise Goal Structure, Elicit Enterprise Goal Structure, Participative Modelling Strategy*>. A participative modelling session is typically carried out using a large plastic sheet on the wall where participants post their descriptions of different components of the models used. After this session, the modelling technicians transport the model produced on the plastic sheet into a computerised tool, analyse, restructure and refine it. Then a walk-through seminar takes place in a room equipped with means to expose the results. Finally continued work proceeds as iterations of additional analysis and restructuring work and additional walk-throughs.

The analyst driven strategy seems appropriate in the situations where the organisational maturity of modelling and the participative involvement are low, the organisational culture is hierarchical and the problem is relatively well defined. The analyst driven strategy to elicit enterprise goal structure, as well as participative modelling strategy, is based on the premise that the vision of the future does not pre-exist in the minds of the change engineers and the stakeholders but needs to be formulated through brainstorming and deliberating. Nevertheless, a low level of the maturity of modelling of stakeholders and a hierarchical culture of the organisation call for more guided analyst driven co-operative modelling sessions rather than participative modelling sessions. The guideline associated to map sections <Elicit Enterprise Goal Structure, Elicit Enterprise Goal Structure, Analyst Driven Strategy> and <Start, Elicit Enterprise Goal Structure, Analyst Driven Strategy> suggests to discuss respectively (i) on the contextual forces which constraint the enterprise to change and on the future enterprise requirements and (ii) on currents goals of the enterprise. A contextual force is a constraint external to the company that shall be taken into account while studying changes. Future requirements are the goals describing the envisioned future state of the company. The Analyst Driven Strategy and the use of a CSCW tool [23] allow the stakeholders to formulate freely (brainstorming) their vision of the future, and then to deliberate and negotiate with each other. This results in a shared understanding of the issues involved in the change process.

The guideline associated to map sections <Start, Elicit Enterprise Goal Structure, Process Clustering Strategy> and <Conceptualise Enterprise BPM, Elicit Enterprise Goal Structure, Process Clustering Strategy> suggests to abstract the goals corresponding to the current state of the enterprise [6] by clustering the business processes aiming to achieve the same high-level business goal and to structure them in a goal hierarchy.



Figure 15. Applying EKD-CMM guidelines *directly*

The guideline associated to map section <Elicit Enterprise Goal Structure, Elicit Enterprise Goal Structure, Goal Deployment Strategy> supports the transformation of the hierarchy of current goals into a change process model [11]. The goal deployment strategy focuses on the analysis of the impact of the external constraints and the future requirements on the current enterprise goals. The product of this guideline is a hierarchy of goals [8]. It contains a particular type of goals, called *change goals*. Change goals tell us how to change the organisation, i.e. what should be improved, what should be introduced and what should cease to be performed in the organisation. The change process model describes all possible roads that the enterprise can follow to reach its envisioned future state in which all constraints imposed by the contextual forces will be satisfied [15].

The guideline associated to map section <Elicit Enterprise Goal Structure, Elicit Enterprise Goal Structure, Evaluation Strategy> consists of revisiting the change process model in order to identify and then evaluate alternative scenaria against pre-defined criteria. Based on this evaluation, comparisons of alternative scenaria occurs and recommendations are made concerning the most appropriate scenaria. The application of this guideline leads to the fourth organisational change state ‘alternative scenaria evaluated and one selected’. This means that the end of the change management route is reached and the completeness strategy suggests to stop.

Let us illustrate now one guideline in detail. Let us suppose that, the change engineer which has previously decided to follow the ‘bottom-up’ route offered by the electronic guide book (see figure 12), want to apply the goal deployment strategy in the fourth step of this route (see figure 13). By clicking on the corresponding hypertext link, he/she will browse the EKD-CMM guideline associated to this map section. As shown in figure 8, the modelling process described in this guideline consists of progressively generating the hierarchy of change goals by studying the impact of the contextual forces onto the current goals and of highlighting the impacts of the change on current business processes. First, the current goal hierarchy is considered in a top down manner starting with the top level goal and examining its descendants step by step, until the leaves are reached. The hierarchy of change goals which describes the alternative scenaria for change is constructed accordingly, in a top down manner, step by step, by generating the change goals either as improvements of the current goals or by introducing new goals. Then, in order to facilitate the conceptualisation of the future enterprise state which will be performed afterwards, for each leave of the hierarchy of change goals, current processes which will be maintained, extended or improved will be attached.

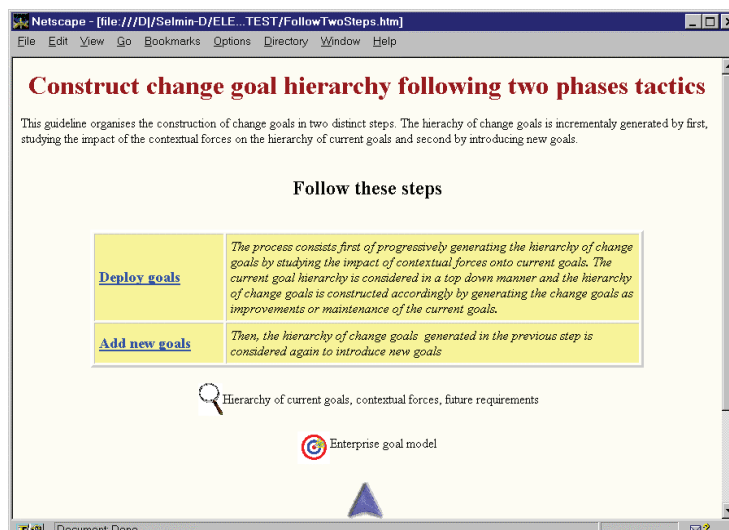


Figure 16. Guideline for constructing the change goal hierarchy following the two phases tactics

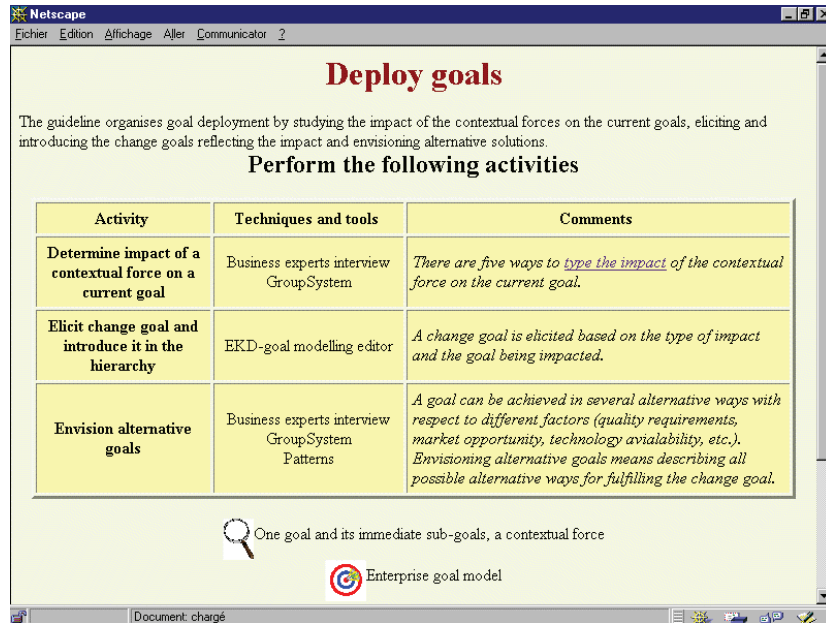


Figure 17. Guideline for deploying the current goal structure

The guideline suggested for the first activity was introduced in figure 7. Let us suppose that in the situation at hand there are two different groups of stakeholders involved in the definition of the change process model, one being knowledgeable on what should be changed in the current functioning of the enterprise and the other for what should be introduced. The change engineer selects than the second alternative shown in figure 7. The corresponding guideline suggested for constructing the change goal hierarchy will now be described through an example of browsing. Roughly speaking the process for *constructing the change goal hierarchy following two phases tactics* iterates for each goal in the current goal hierarchy on the two main activities: ‘*deploy goals*’ and ‘*add new goals*’ as shown in figure 16.

The first step organises goal deployment by studying the impact of the contextual forces on the current goals, eliciting and introducing the change goals reflecting the impact and envisioning alternative solutions (see figure 17). There are four ways to type the impact of a contextual force on a current goal : ‘improve’, ‘extend’, ‘maintain’ and ‘cease’ (see figure 18).

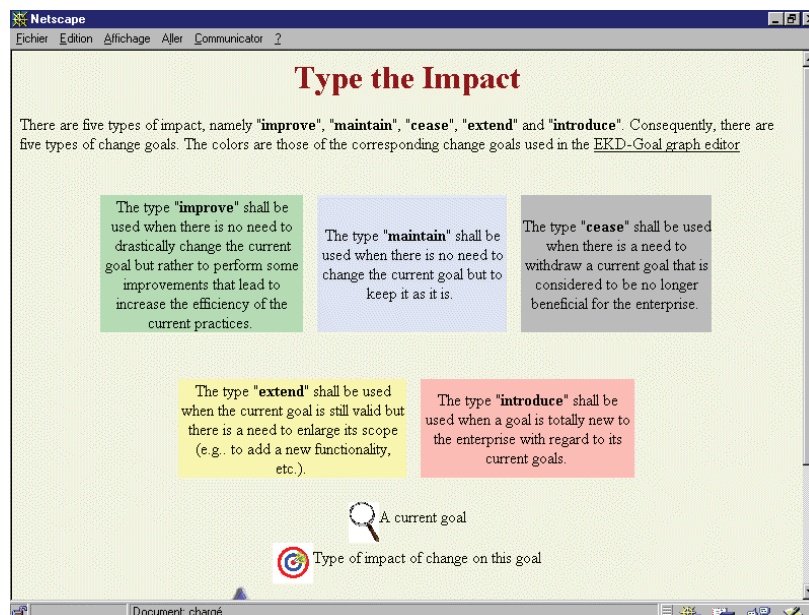


Figure 18. Guideline for determining the impact of the change on a current goal

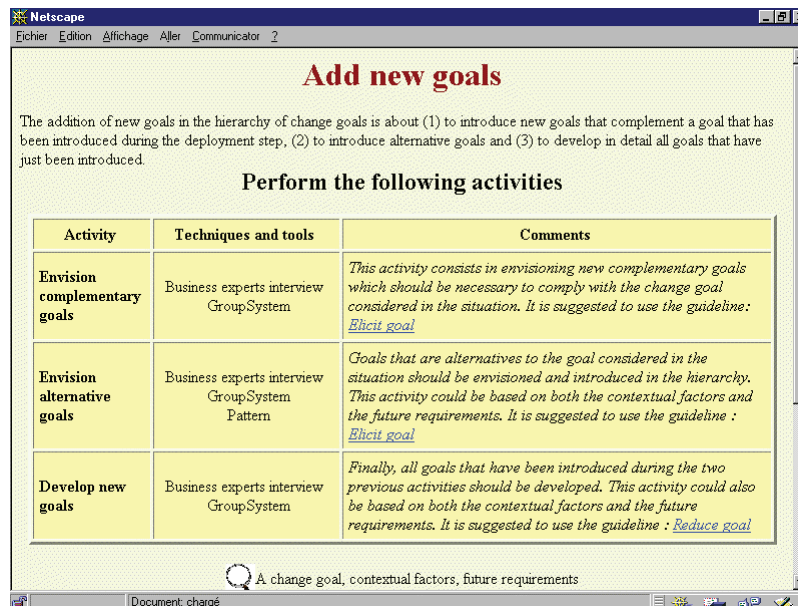


Figure 19. Guideline for adding new goals in the change goal hierarchy

The second step of the guideline shown in figure 16 suggests to introduce new goals complementing goals that have been elicited during the deployment step, to introduce alternative goals and to develop in detail all goals that have been introduced. The guideline suggested for this step is shown in figure 19.

In summary, the guideline suggested for map section <Elicit Enterprise Goal Structure, Elicit Enterprise Goal Structure, Goal Deployment Strategy > recommends an intention-driven modelling process which results in a hierarchy of change goals including the alternative roads to be followed by the enterprise in order to reach the envisioned future state.

When the change engineer wants to conceptualise the current or future enterprise processes, the page of the electronic guide book shown in figure 20 offers him/her two guidelines associated to road map sections <Elicit Enterprise Goal Structure, Conceptualise Enterprise BPM, Participative Modelling Strategy> and <Start, Conceptualise Enterprise BPM, Analyst Driven Strategy>. The guidelines associated to <Elicit Enterprise Goal Structure, Conceptualise Enterprise BPM, Analyst Driven Strategy> and <Conceptualise Enterprise BPM, Conceptualise Enterprise BPM, Evaluation Strategy> have not been developed and therefore are not proposed as choices in this page.



Figure 20. Suggested guidelines for conceptualising enterprise BPM

4. Conclusion

The Enterprise Knowledge Development-Change Management Method looks upon the change process as intention driven. Multiple EKD-CMM ways of working included in the EKD-CMM road map provides users of the EKD-CMM with the possible routes of using the method depending on their intentions, the methodological situation they are in, and the tools available to them. Nevertheless, we believe that mastering the change in an organisation requires four key states to be reached while modelling with EKD-CMM. These are the 'As-Is' state defining the current business processes and objectives, the 'To-Be' state defining the future business processes and goals, the 'Alternative scenaria for change determined' state defining the alternative scenaria for describing the possible alternative routes to be followed by the enterprise in order to reach its envisioned future state complying with the external factors, and the 'Alternative scenaria evaluated and one selected' state resulting of the evaluation of the alternative scenaria and the selection of the most appropriated one.

EKD-CMM guidelines describe a number of activities that should be performed in a certain order in order to fulfil the EKD-CMM modelling intentions. The products of these guidelines are conceptual models which model the enterprise, its reengineering requirements and the alternative scenaria for change.

The purpose of the EKD-CMM electronic guide book that has been presented in this paper is first to help the change engineer to understand the EKD-CMM method, second to guide him/her to choose the way of selecting guidelines associated to the road map sections (through the road map, through routes, through change management steps or freely), third to help him/her to select the guideline to be executed next, and fourth to guide the task performance.

This work has been realised in the ELEKTRA project which aims to discover generic knowledge of change management for reusing it in similar settings in other electric supply companies. EKD-CMM applied in this project provided a systematic way to organise and to guide the change management in the context of an industrial application concerning the deregulation of a large European electricity company with a particular focus on the company's distribution unit [11]. This company is in the process of redesigning its business structure, in anticipation of the opening of the European electricity market. The benefits for the company for having used the method presented in this paper are the following : (a) The systematic and guided search for alternative manners to achieve a change goal, being either an improvement, an extension of an existing goal or the introduction of a goal was very positive. Indeed, it helped the stakeholders to envisage innovative solutions ; (b) Because the goal deployment strategy uses as input the 'As-Is' state, the stakeholders were able to point the impacts of the change they proposed on the existing processes ; (c) Using the output of the goal deployment approach, the change model process, the stakeholders were able to carry out an informed evaluation of the alternative scenaria for change to select the most appropriate one.

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