

Intention Based Modelling of Organisational Change: An Experience Report

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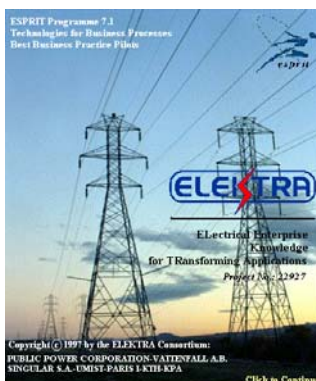


Fourth CAISE/IFIP8.1 International Workshop on Evaluation of
Modeling Methods in Systems Analysis and Design (EMMSAD'99)



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Introduction and Context of Work : The ELEKTRA Project



Managing change in electricity supply
and distribution companies due to
deregulation rules issued by the E.C.

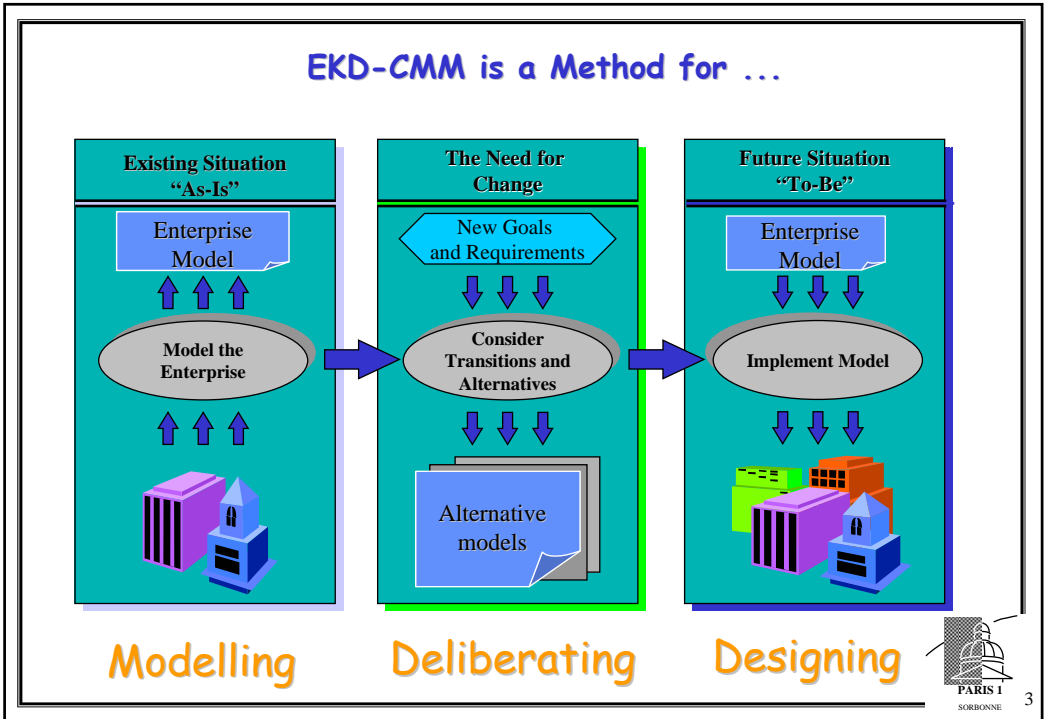
Public Power Corporation, Greece

- 35 000 employees
- operating as a total monopoly
- 6 million customers

The purpose of the work : to allow the ESI sector companies to deal with
change in a controlled way which would lead to an evaluation of alternative
options of possible means to meet the objectives for change.




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A method is composed of :

- ❖ a way of **Thinking**
- ❖ a way of **Modelling**
- ❖ a way of **Working**

(Seligmann 93)


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As a method EKD-CMM is composed of :
(Enterprise Knowledge Development - Change Management Method)

❖ a Way of **Thinking**

❖ a Way of **Modelling**

❖ **several** Ways of **Working**

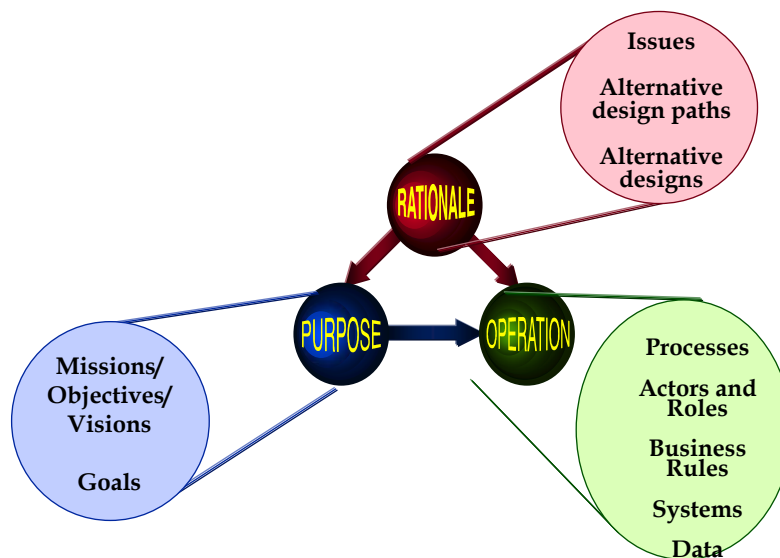
What makes EKD-CMM unique:

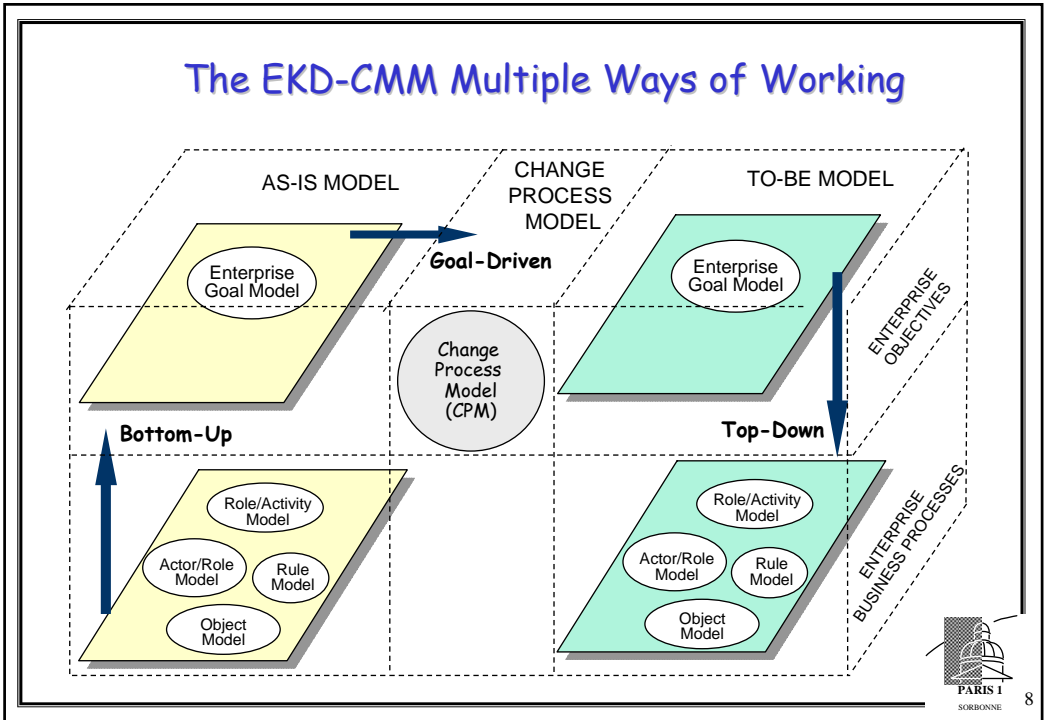
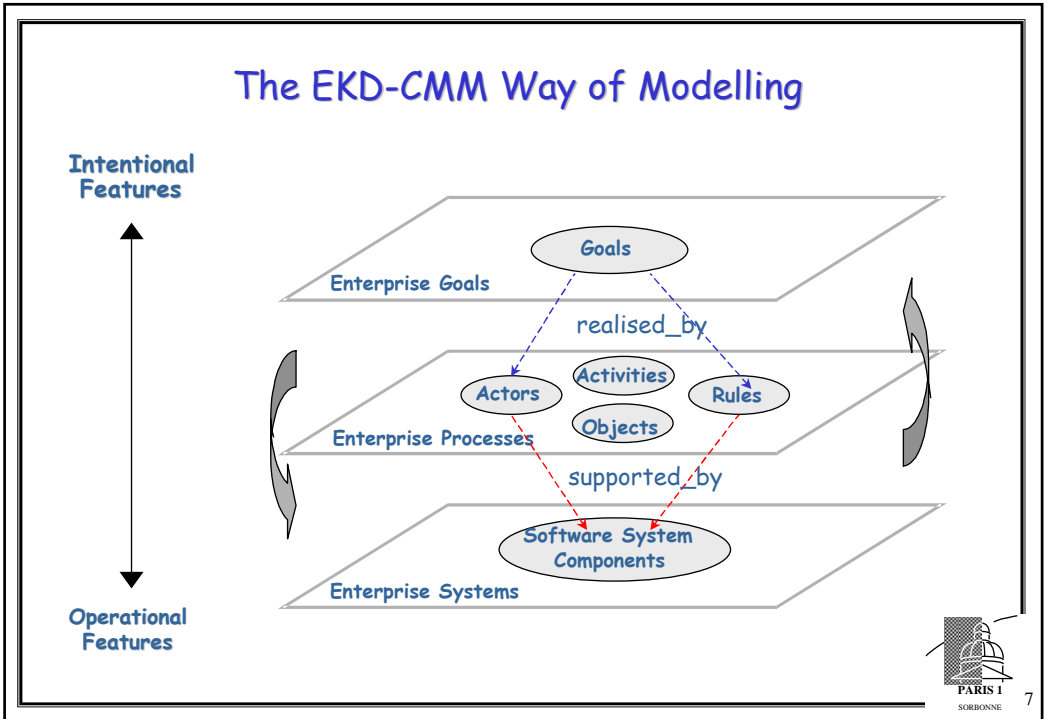
❖ **Its situatedness**

EKD-CMM is a **multi-method**.



The EKD-CMM Way of Thinking



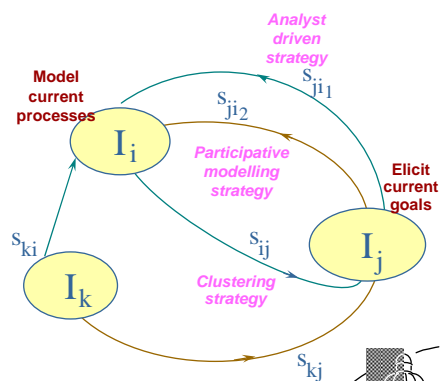


The multi-method view of EKD-CMM

Representing the multiple ways of working in a Road Map :
a directed and labelled graph of intentions and strategies

A strategic view of a method

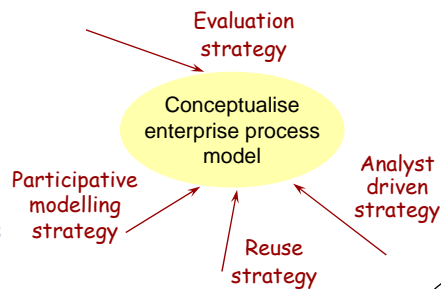
- goal and strategy directed
(consistent with the EKD paradigm)
- with a guideline attached to each section
 $\langle I_i, I_j, S_{ij} \rangle$
- allowing:
 - multi routes representation
 - sharing the same set of guidelines
 - dynamic decision about the next step



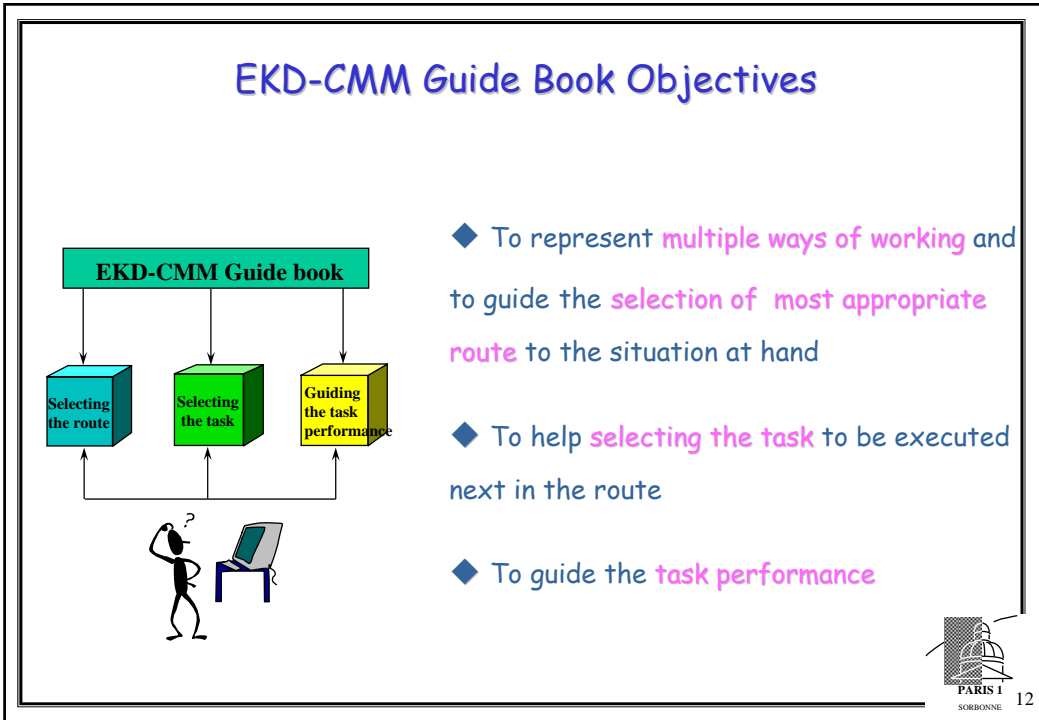
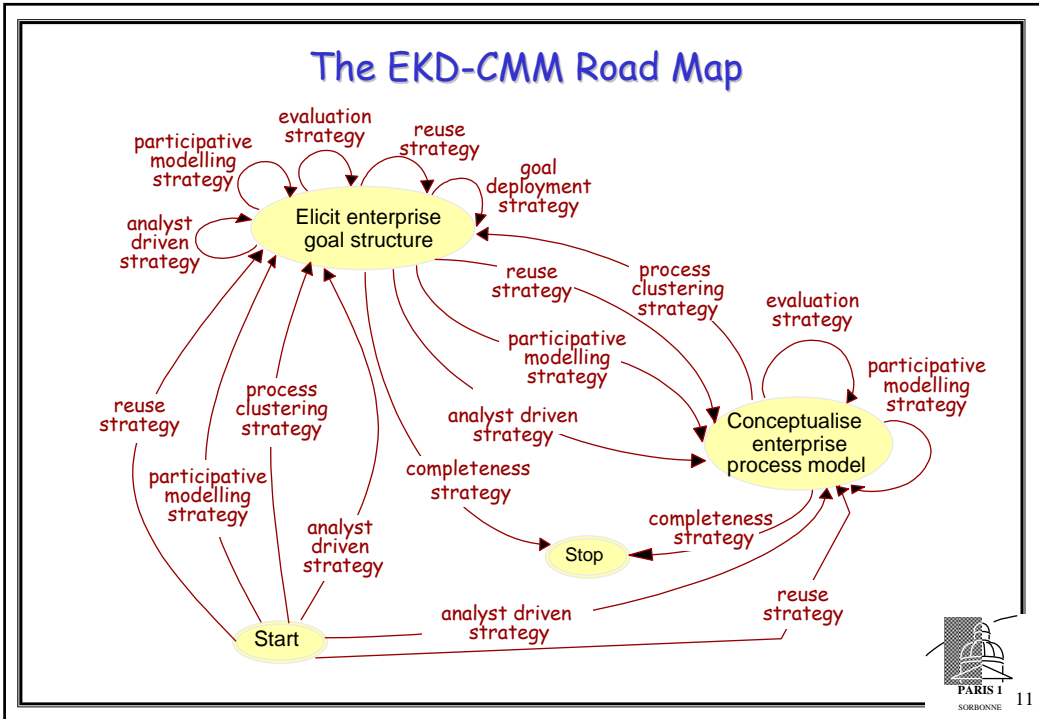
The EKD-CMM Process Intentions and Strategies



Elicit Enterprise Goal Structure refers to activities that are needed to identify goals and to relate them one another through AND, OR and AND/OR relationships.



Conceptualise Enterprise Business Process Model refers to all activities required to construct a business process model.



- ◆ To represent **multiple ways of working** and to guide the **selection of most appropriate route** to the situation at hand
- ◆ To help **selecting the task** to be executed next in the route
- ◆ To guide the **task performance**

Guiding the Selection of a Way of Working

Situational factors help selecting the route appropriate to the situation at hand.

Helping the Selection of the Task to be Executed

Each route identifies the set of tasks to be performed and suggests their ordering.

Follow the Bottom-up Route

The bottom-up route comprises six steps, namely B1 to B6. The guideline to perform each step is accessible by the name of the corresponding modeling strategy (the blue underlined statement in the following table).

B1	: <i>Conceptualise Current BPM</i> from <i>Start</i> following Analyst Driven Strategy
B2	: <i>Elicit Current Goal Structure</i> from <i>Current BPM</i> following Process Clustering Strategy
B3	: <i>Elicit Future Goal Structure</i> from <i>Current Goal Structure</i> following Analyst Driven Strategy
B4	: <i>Elicit Change Goal Structure</i> from <i>Current Goal Structure</i> following Goal Deployment Strategy
B5	: <i>Elicit Most Suitable Change Goal Structure</i> from <i>Change Goal Structure</i> following Evaluation Strategy
B6	: <i>Stop</i> from <i>Change Goal Structure</i> following Completeness Strategy

Guiding the Performance of the Task

There is a **guideline** for each task.

It provides advices and recommendations on how to carry out the task



The guideline Template

Guideline Template	Example		
Name of the guideline : It expresses a process intention	Construct change process model		
Description of the guideline: It provides a summary of the content of the guideline	This guideline provides two alternative manners to construct a change process model.		
Body of the guideline : It tells how to achieve the intention by providing steps, choices, activities to be performed and the related models to be used. <i>In the right side example, the guideline offers two alternative ways (choices) to achieve the intention of constructing a change process model.</i>	Select your alternative <table border="1"><tr><td>Follow goal deployment strategy <i>Current enterprise goals, requirements for the future and contextual forces driving the change are known. Stakeholders call for a guided process.</i></td><td>Follow participative strategy <i>Current enterprise goals and requirements for the future are not agreed upon. Therefore, a participative session allowing emergence, exchange and discussion of ideas is needed.</i></td></tr></table>	Follow goal deployment strategy <i>Current enterprise goals, requirements for the future and contextual forces driving the change are known. Stakeholders call for a guided process.</i>	Follow participative strategy <i>Current enterprise goals and requirements for the future are not agreed upon. Therefore, a participative session allowing emergence, exchange and discussion of ideas is needed.</i>
Follow goal deployment strategy <i>Current enterprise goals, requirements for the future and contextual forces driving the change are known. Stakeholders call for a guided process.</i>	Follow participative strategy <i>Current enterprise goals and requirements for the future are not agreed upon. Therefore, a participative session allowing emergence, exchange and discussion of ideas is needed.</i>		
Situation : It precises when the guideline can be applied	There is a need to move the organisation from the current state to a future state		
Product model : It refers to the EKD-CMM model used for the application of the guideline. In the right side example, the product model is the Enterprise goal model as the output of the guided process is a goal hierarchy called change process model.	Enterprise goal model		

Guideline Types

Understand Types of Guidelines

This page describes and illustrates with examples the types of guidelines used to present any EKD-CMM guideline available in this electronic guidebook, respectively choice, plan and executable guidelines. The description is given in the left part whereas the example is shown in the right part.

[formalism used](#)
 [choice guideline](#)
 [plan guideline](#)
 [executable guideline](#)

The body of a **Choice Guideline** offers different alternative ways for achieving the process intention. For example, the guideline shown in the right side is a choice guideline introducing two alternatives to the construction of the change process model, each alternative proposing a specific strategy.

Arguments (in italics) are provided to help in the selection of the most appropriate alternative in the actual process. For example, the *Follow goal deployment strategy* is the right decision to make when current enterprise goals, requirements for the future and contextual forces driving the change are known.

Click [here](#) for more information.

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Construct change process model

Select your alternative

<p><u>Follow goal deployment strategy</u></p> <p><i>Current enterprise goals, requirements for the future and contextual forces driving the change are known. Stakeholders call for a guided process.</i></p>	<p><u>Follow participative strategy</u></p> <p><i>Current enterprise goals and requirements for the future are not agreed upon. Therefore, a participative session allowing emergence, exchange and discussion of ideas is needed.</i></p>
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Guideline Types

Follow goal deployment strategy

Follow these steps

The body of a **Plan Guideline** proposes a set of steps to be followed for achieving the process intention.

For example, the guideline *Follow goal deployment strategy* shown in the right side is a plan guideline composed of two component guidelines (steps), namely *Construct a hierarchy of change goals*, and *Attach processes*. This means that, when using the goal deployment strategy, the EKD-CMM user has first to construct the hierarchy of change goals and then to attach processes to the leaves of this hierarchy.

Click [here](#) for more information.

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<u>Construct a hierarchy of change goals</u>	<i>The construction of the hierarchy of change goals is an iterative process which consists of progressively generating the change goals by studying the impact of the external constraints onto the current goals of the enterprise. Change goals are generated either as possible evolutions of the current goals or by introducing new ones.</i>
<u>Attach processes</u>	<i>In order to facilitate the conceptualisation of the future enterprise state, this step suggests to attach current business processes to change goals. Depending of the type of the change goal, the attached process shall be maintained, improved or extended.</i>

Guideline Types

The body of an Executable Guideline proposes a set of activities to be carried out. Each activity is associated to techniques and tools and a short description (comments). On the right side, the executable guideline suggests the following activities: 1) to determine the impact of an external constraint on current goals; 2) to elicit change goals, and 3) to envision alternative goals.

Construct a hierarchy of change goals

Perform the following activities

Activity	Techniques and tools	Comments
Determine impact of a contextual force on a current goal	Interview business experts. Use <i>GroupSystem</i> .	There are five ways to type the impact of the contextual force on the current goal.
Elicit change goal and introduce it in the hierarchy	Use <i>EKD-goal modelling editor</i>	A change goal is elicited based on the type of impact and the goal being impacted.
Envision alternative goals	Interview business experts. Use <i>GroupSystem</i> . Use <i>Patterns</i> .	A change goal can be achieved in several ways with respect to different factors (quality requirements, market opportunity, etc.). Envisioning alternative goals means describing all alternative ways for fulfilling the change goal.

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A Walk Through the Bottom-up Route

Follow the Bottom-up Route

The bottom-up route comprises six steps, namely B1 to B6. The guideline to perform each step is accessible by the name of the corresponding modelling strategy (the blue underlined statement in the following table).

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ElectronicBrainstorming - Netscape

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Conceptualise Current BPM from Start Following Analyst Driven Strategy

This guideline suggests to observe the current context of the enterprise and to model it using enterprise business process models.

Perform the following activities

Activity	Techniques and tools	Comments
Observe the current state of the enterprise	Top managers and/or domain experts interview	<i>The observation of the current state of the enterprise is required to understand the enterprise processes, to identify actors and resources which are involved, the dependencies between actors and the business objects which are used in the enterprise processes.</i>
Define actor/role diagrams	EKD Actor/Role modelling editor	<i>This activity leads to the description of business processes by identifying collections of responsibilities (each such collection constituting a role) and the organisational entities (the actors) that fulfil these responsibilities. The dependencies (authority, resource, goal) between involved roles are also described.</i>
Define role/activity diagrams	EKD Role/Activity modelling editor	<i>This activity completes the description enterprise processes by detailing how roles are organised in terms of activities in order to achieve the enterprise objectives. Each role is thus analysed in a sequence of activities that the respective actor performs in playing the role.</i>
Define class/association, state transition and event diagrams	EKD Enterprise Object modelling editor	<i>This activity aims to define first business objects which are used in the enterprise processes. Then event diagrams describing the impact of what happens in the enterprise on these objects are produced. For instance, for a new connection request a new account is created. Finally, for each identified object, its life-cycle describing the state changes induced by these events are described in a state transition diagram.</i>
Check consistency between static and		<i>This activity verifies if objects required for the performance of business processes as described in the role/activity diagrams are defined in the class/association diagrams, if all</i>

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Summary of Current Processes

CS: Customer Section
TS: Technical Section
AO: Administration Office

Centrally Serviced Requests

- C1 - New 15/20 KV Substations Construction (Attica)
- C2 - New U/G 150 KV Lines Construction (Attica)
- C3 - New Underwater Lines Construction (Islands)
- C4 - New Substation Buildings Construction (Attica)
- C5 - New Housing Construction for Distribution Units
- C6 - Underground 150 KV Cable Re-routing
- C7 - New 20 KV Outgoing Feeders Installation (Attica)
- C8 - Provision of Charts and Topographical Equipment
- C9 - Technical Queries Answering
- C10 - Provision of Equipment for Maintenance
- C11 - Materials & Working Procedures Improvement

C1' - Forecasting
C2' - Contractor Selection
C3' - Technology Watch (network)
C4' - MSE Technology Watch
C5' - MSE Planning
C6' - Network Quality & Protection Insulation Coordination Studies
C7' - Network Quality & Protection Insulation Coordination Works
C8' - Billing
C9' - Accounting
C10' - Provision of IT Support

Region Serviced Requests

District Serviced Processes

- A1 - Electricity Supply Application Fulfillment
- A2 - Network Resitiation
- A3 - Meter Disconnection
- A4 - Meter Re-connection
- A5 - Meter Check
- A6 - Installation Modification
- A7 - Failure Restoration
- A8 - Billing Correction
- A9 - New 20/0.4 KV Substations Construction
- A10 - New 20 KV Line Construction
- A11 - New U/G 20 KV Line (non Attica) Construction
- A12 - New Building Construction for 20/0.4 KV S/S
- A13 - U/G Cable Re-routing for 20KV Lines

A1' - Meter Reading
A2' - Payment Collection
A3' - Electricity Cut-off
A4' - Electricity Re-connection

**set of EKD-CMM models
for over 150 business processes**

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FollowProcessClustering - Netscape


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Elicit Current Goal Structure from Current BPM Following Process Clustering Strategy

This guideline suggests to define the goal hierarchy of the enterprise corresponding to its current state, by clustering the business processes aiming to achieve the same high-level business goal. It is based on the understanding of objectives corresponding to the current functioning of the enterprise. The current state of the enterprise should be formally described previously using enterprise business process models.

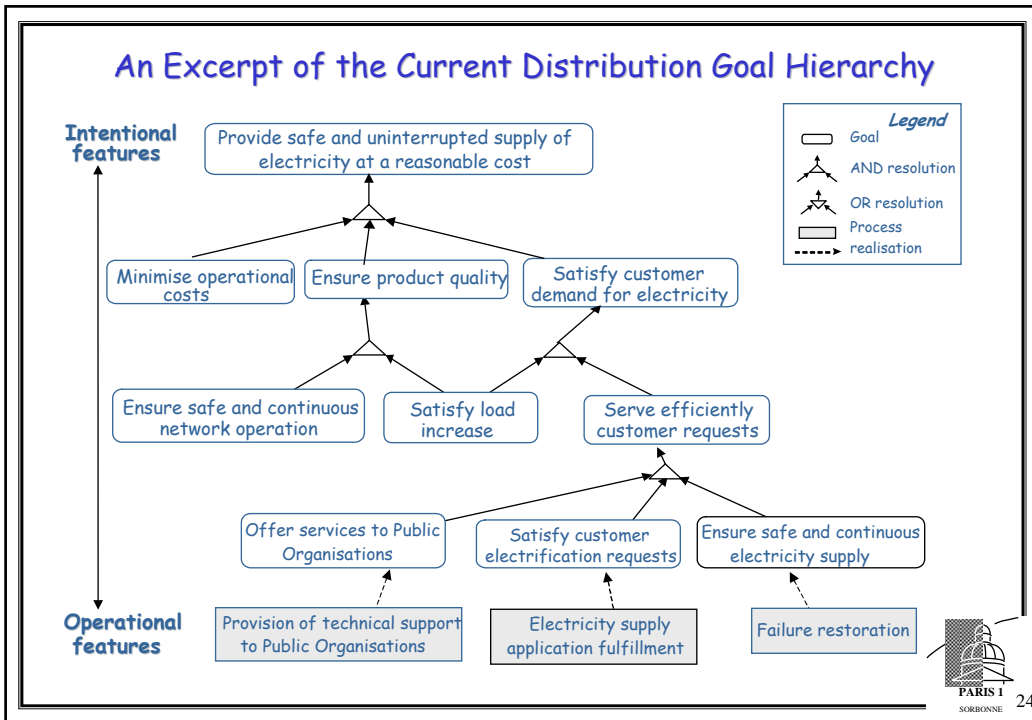
Perform the following activities

Activity	Techniques and tools	Comments
Identify goals reached by current business processes	Top managers and/or domain experts interview	A business process provides some desired output to an internal or external customer. Roughly speaking, when a process is defined in a detailed level, the delivery of the output can be considered as the operational goal attached to the process.
Identify macro-processes and the corresponding enterprise goals	Modelling sessions	Processes do not operate independently but are related in different ways. (i) They can have temporal relationships expressing the triggering of a process by another one. (ii) A process defined in a detailed way at the operational level can be seen as an activity in a macro-process. This leads to the identification of macro-processes characterised by higher level goals.
Organise enterprise goals in a goal hierarchy	EKD goal modelling editor	The recursive application of the process aggregation mechanism leads to the construction of a hierarchy of goals describing the current objectives of the enterprise. The leaves of this hierarchy correspond to operational goals classified in more and more general goals.

 Current enterprise business process models are formally described

 Enterprise goal model

Document chargé




EvaluationStrategy - Netscape
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Elicit Future Goal Structure from Current Goal Structure Following Analyst Driven Strategy

This guideline provides a structured approach towards

Perform the following activities

Activity	Techniques and tools	Comments
Capture Goals list	Top managers and/or domain experts interview, Group System (Brainstorming or Topic Commenter)	<i>An initial list of goals has to be acquired either through interviews or during a brainstorming session.</i>
Improve Goals list	Group System (Categorizer)	<i>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.</i>
Prioritise Goals	Group System (Voting)	<i>It might be appropriate to rank the different goals and eliminate those that are considered as unimportant.</i>
Organise Goals list into hierarchy	Group System (Group outliner)	<i>The list of selected goals can be hierarchically organised using for example the Group Outliner facility provided by Group System.</i>










 The organisational maturity of modelling and the degree of «participative» involvement are low,
 the organisational culture is hierarchical, and the external pressures are known.










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An Excerpt of the Future Requirements

GroupSystems - PPC Goal Modelling Session (Athens 8-10 Sep 1997) - [Goal hierarchy conce...]


File Edit Outliner Group Options Window Help

- 0 / 0 Improve efficiency of current processes
- 0 / 0 — Customer services
- 0 / 0 — Product quality
 - 0 / 0 — Ensure always accurate billing
 - 0 / 0 — Improve reliability of the supply system and constant voltage and frequency
 - 0 / 0 — Minimize the duration and number of programmed interrupts of the power.
 - 0 / 0 — minimize the duration of planning and construction of new networks
 - 0 / 0 — Improve network quality
- 0 / 0 — Efficiency and effectiveness
- 0 / 0 — Human resources
 - 0 / 0 — Improve employee training towards customer needs
 - 0 / 0 — Create new incentive policies
 - 0 / 0 — Improve the allocation of personnel to projects
 - 0 / 0 — Define job profiles and competencies

46 topics 0 comments 1:18 Vagelio Kavakli

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GoalDeployment - Netscape
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Elicit Enterprise Change Goal Structure from Current Goal Structure Following Goal Deployment Strategy

This guideline provides a way to construct the change process model in terms of a hierarchy of change goals and to highlight the impacts of the change on the current processes. The change process model includes the description of alternative change scenarios that the enterprise could follow in order to reorganise itself to meet its specific requirements for the future and to comply with the external constraints called "contextual forces".

Follow these steps

<u>Construct change goal hierarchy</u>	<i>This steps aims at constructing the hierarchy of change goals which describes the different envisionable scenaria for change.</i>
Attach processes	<i>For each leave of the hierarchy of change goal, current processes which will be maintained, extended or improved will be attached.</i>

 Hierarchy of current goals, contextual forces, future requirements, documentation on existing processes

 Enterprise goal model

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Construct change goal hierarchy

This guideline provides two different ways to construct the hierarchy of change goals depending of the sources of knowledge to a) improve the current situation, b) envision future options for the enterprise.

Select your alternative

<u>Follow one shot strategy</u> <i>The stakeholders that will be involved in the definition of the change process model are aware of both what should be changed in the current functioning of the enterprise as well what should be introduced.</i>	<u>Follow two phases strategy</u> <i>There exists two different groups of stakeholders that will be involved in the definition of the change process model. These two groups have different knowledge. One group is aware of what should be changed in the current functioning of the enterprise. The second group is aware of what should be introduced.</i>
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 Hierarchy of current goals, contextual forces, future requirements

 Enterprise goal model

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Construct change goal hierarchy

This guideline organises the construction of change goals in two distinct steps. The hierarchy of change goals is incrementally generated by first, studying the impact of the contextual forces on the hierarchy of current goals and second by introducing new goals.

Follow these steps

Deploy goals	<i>The process consists first of progressively generating the hierarchy of change goals by studying the impact of contextual forces onto current goals. The current goal hierarchy is considered in a top down manner and the hierarchy of change goals is constructed accordingly by generating the change goals as improvements or maintenance of the current goals.</i>
Add new goals	<i>Then, the hierarchy of change goals generated in the previous step is considered again to introduce new goals</i>

 Hierarchy of current goals, contextual forces, future requirements
 Enterprise goal model

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Deploy goals

The guideline 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.

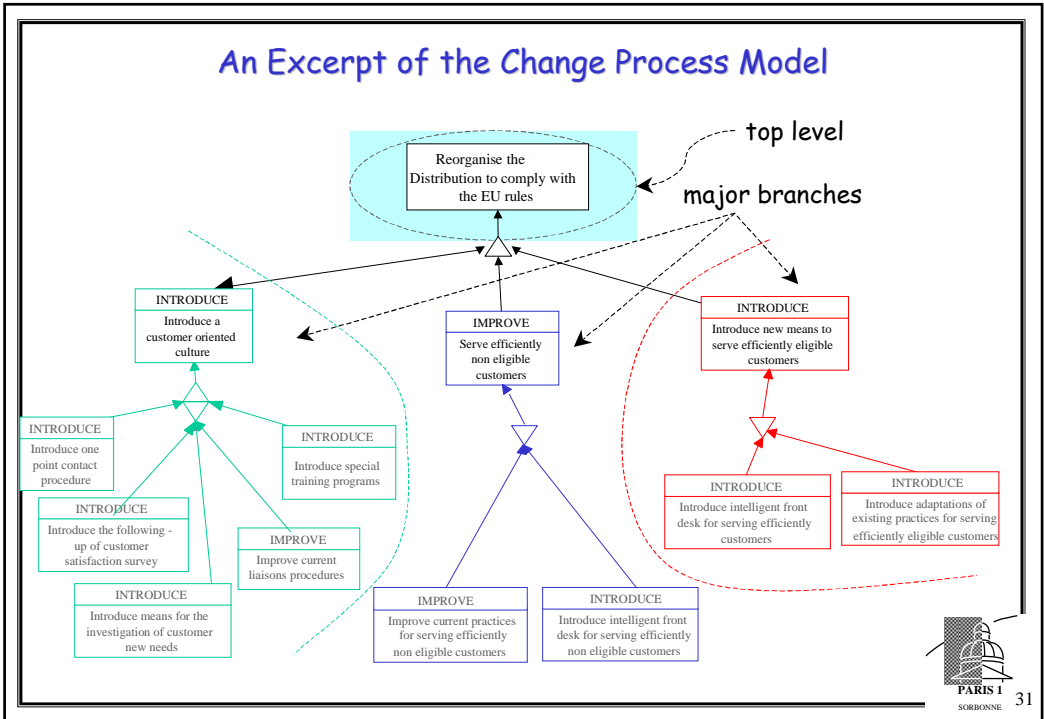
Perform the following activities

Activity	Techniques and tools	Comments
Determine impact of a contextual force on a current goal	Business experts interview GroupSystem	<i>There are five ways to <u>type the impact</u> of the contextual force on the current goal.</i>
Elicit change goal and introduce it in the hierarchy	EKD-goal modelling editor	<i>A change goal is elicited based on the type of impact and the goal being impacted.</i>
Envision alternative goals	Business experts interview GroupSystem Patterns	<i>A goal can be achieved in several alternative ways with respect to different factors (quality requirements, market opportunity, technology availability, etc.). Envisioning alternative goals means describing all possible alternative ways for fulfilling the change goal.</i>

 One goal and its immediate sub-goals, a contextual force
 Enterprise goal model

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Elicit Most Suitable Change Goal Structure from Change Goal Structure Following Evaluation Strategy

This guideline provides a structured approach towards the identification and evaluation of alternative scenarios for change. The pre-requisites for this approach is a change process model (see *Follow goal deployment strategy*). The change process model is revisited so as to identify and then evaluate alternative scenarios against pre-defined criteria. Based on this evaluation, comparisons of alternative scenarios occur and recommendations are made concerning the most appropriate scenario.

Follow these steps

Prune the change process model	<i>This step aims at pruning the change process model in order to limit the number of scenarios to be examined, evaluated and compared.</i>
Perform branch evaluation	<i>In order to limit the complexity of the evaluation process, each branch of the pruned change process model is considered separately. Each scenario in a branch is evaluated first qualitatively and then, quantitatively. Qualitative evaluation is based on criteria whereas quantitative evaluation uses metrics. A preferred set of scenarios is selected by branch.</i>
Perform global evaluation	<i>In this step, the appropriateness of the preferred scenarios defined as sets of branch scenarios resulting of the previous step are globally evaluated. This can result in backtracking on choices made locally.</i>
Derive the preferred set of scenarios	<i>The preferred set of scenarios is documented and recommendations for selection of the most suitable one are provided.</i>

Change process model

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EvaluateAllBranches - Netscape



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Perform Branch Evaluation

This guideline provides a systematic approach for performing scenario evaluation within a branch of the pruned change process model. The term branch refers to a sub-hierarchy of the top level goal of the change process model.

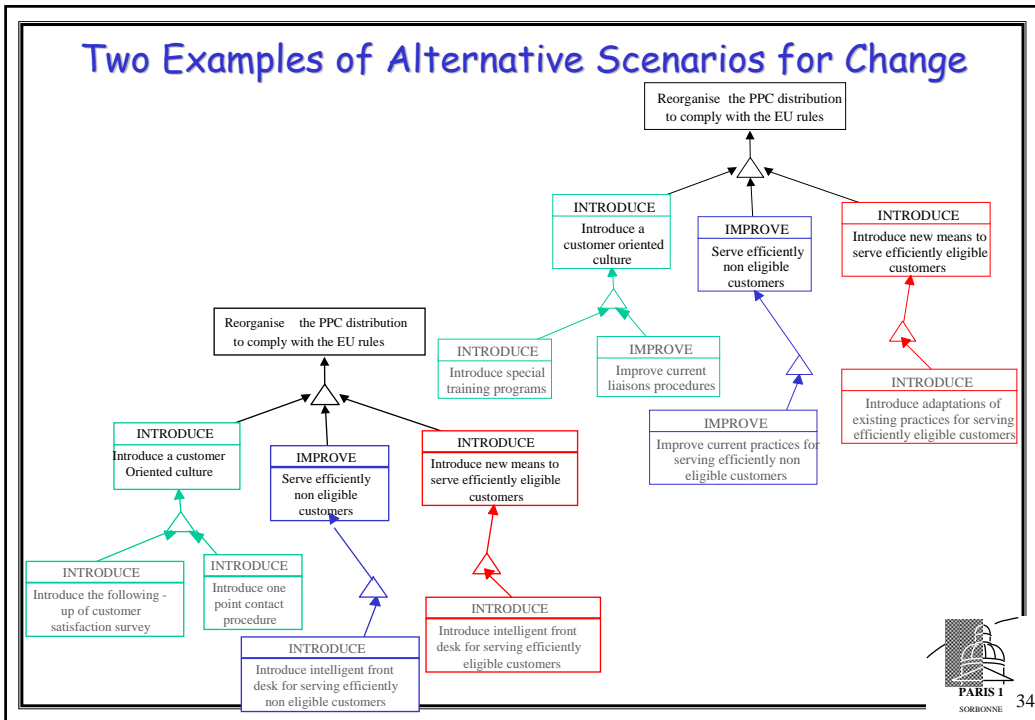
Perform the following steps

<u>Compile the list of scenarios</u>	<i>A description of all possible scenarios within a branch is produced.</i>
<u>Evaluate scenario in a qualitative manner</u>	<i>For each alternative scenario in the branch, a qualitative evaluation based on predefined criteria is performed by several business experts. Individual opinions are aggregated in order to get an average evaluation for each scenario against each criterion.</i>
<u>Assess the level of agreement of the qualitative evaluation</u>	<i>The discrepancy among individual evaluations is used to assess if there is consensus or not on the average evaluation of each scenario.</i>
<u>Choose preferred scenario</u>	<i>The preferred set of scenarios is selected after performing a quantitative evaluation (for scenarios with low consensus) and a comparative evaluation.</i>

 A branch of the pruned change process model
 Scenario model

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Some Results of the Qualitative Evaluation

Vote Spread - Qualitative evaluation : Evolutionary scenario [Vote]

	Ballot Item	VH (5)	H (4)	A (3)	L (2)	VL (1)	NA (0)	Total	Mean	STD
1	C6.5 : Time to implementation	2	2	0	0	0	0	18	4.50	0.58
2	C1.1 : Ability to get necessary resources	1	3	0	0	0	0	17	4.25	0.50
3	C1.2 : Ability to utilise necessary expertise	1	3	0	0	0	0	17	4.25	0.50
4	C3.1 : Implementation costs	1	2	1	0	0	0	16	4.00	0.82
5	C4.1 : Concern for people (employees of PPC) vs. busine	1	2	1	0	0	0	16	4.00	0.82
6	C5.1 : Customer satisfaction	1	2	1	0	0	0	16	4.00	0.82
7	C5.3 : Accuracy of services provided	1	2	1	0	0	0	16	4.00	0.82
8	C5.4 : Reliability	1	2	1	0	0	0	16	4.00	0.82
9	C6.1 : Throughput(Customers/ employee)	1	1	2	0	0	0	15	3.75	0.96
10	C6.3 : Sales/employee(Kwh/employee)	1	1	2	0	0	0	15	3.75	0.96
11	C2.2 : Global impact (Change affects the whole org.)	0	2	2	0	0	0	14	3.50	0.58
12	C6.4 : Rightsizing	0	2	2	0	0	0	14	3.50	0.58
13	C3.2 : Operation costs	0	3	0	1	0	0	14	3.50	1.00
14	C6.2 : Timeliness	1	1	1	1	0	0	14	3.50	1.29
15	C5.2 : Responsiveness	0	1	3	0	0	0	13	3.25	0.50
16	C2.1 : Local impact (Change affects a small number of pr	0	1	2	1	0	0	12	3.00	0.82

Selected row: C1.1 : Ability to get necessary resources

Total number of voters [N]: 4

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Conclusion

EKD-CMM provides a framework within which we can :

- ❖ share an understanding of how the enterprise functions
- ❖ share a vision for whatever change is required
- ❖ develop scenaria for implementing the change
- ❖ develop arguments for and against the various scenaria
- ❖ keep a history of decisions made during the process
- ❖ manage all the descriptions in a central repository
- ❖ provide map and guidelines to guide the change process