

Change process implementation: a collective analysis and management procedure

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Abstract

Operational tools may be introduced in change processes to facilitate actual change activation and successful implementation. The adoption of a conceptual framework from literature, and its operationalisation, by means of a system of structured Schemes in a procedure of collective analysis and management, may supply appropriate "tools" for structuring problem situations and their evolutions and may be suitable for being inserted into communication contexts. The integrated use of Schemes and different techniques in a collective process of change analysis, planning and control is described in this paper. The main Schemes are presented in detail, together with some results that have arisen from the application of the system to a change process now in progress.

Keywords

Change process, multicriteria approach, cooperative decision support systems.

1 INTRODUCTION

Change process is defined as the development and implementation of new ideas by people who over time engage in transactions with others within an institutional context. Inventing and implementing new ideas is a collective achievement of pushing and riding those ideas into good currency (Van de Ven, 1986). The actors in this process learn, i.e. invent and fix, new models of integration for the organized action (Crozier, 1977). This consists of both the discovering or, in certain cases, the creation and acceptance of new relational models, new reasoning modalities and a new collective capacity of solving the problems of the collective action. 'Policy formulation and implementation are processes that have not to be viewed as discrete or chronological but as interactive and muddled' (Pettigrew, 1990).

Change is a complex situation in which communication plays a predominant role. Recognizing elements of complexity and originating relevant cognitive and operational actions, in an interactive context, are the basis for activating a change process and for supporting and controlling its implementation. A technical support to the organizational change process should help the involved actors to identify the specific level of complexity and consistent activities in order to transform new ideas into a concrete reality and to communicate, by relevant and formalized structures, in each phase of the change process

(Mucci and Norese, 1989). This paper describes a system developed to support the work of face-to-face groups on organizational change. Formulating and implementing changes within organizations implies the employment of techniques and tools which can work to various degrees of precision in conceptual model building, as and when necessary, according to the needs of the analysis (Humphreys and Berkeley, 1992), facilitating discussion and explicit negotiation of the significant problem elements, enabling the structuring of different courses of action and their assessment and control.

The system proposes a set of structured Schemes to support identification and analysis of the change process key elements, and their integration with different tools, that have been proposed in literature, in a procedure of collective analysis and management. Schemes and procedure have been tested in relation to some change processes that have already been concluded, in order to redefine the steps and global evolution as though the process management were a formal collective action. The system and its Schemes are now used, as a support for the initial stages of two technological and organizational change processes.

The integrated use of Schemes and different techniques in a collective process of change analysis, planning and control is described in the second section by a tool of structural modelling. The main Schemes are presented in detail in the third section. Some results arising from the application of the system to a change process now in progress allow the procedure to be analysed in the last section.

2 CHANGE ANALYSIS AND MANAGEMENT PROCEDURE

The starting point of the procedure application is the definition of a collective context of Change Analysis and Management (CAM Team or simply The Team). An initial problem formulation, mainly of a colloquial or textual nature, should define all the significant elements that characterize the problem situation (the team's role, the nature and freedom of action, organizational change situation, actor situation at least in terms of role and the resources of the involved individuals, groups and organizations and so on). These elements are essential to recognize the situation complexity and elaborate possible inquiry actions. Different courses of action may be activated and techniques and tools may be called; a system of structured Schemes connects the sequence of actions to increase the efficiency and effectiveness of change analysis and management meetings (Huber, 1984).

A Map has been used to describe the system and the main procedure passages. This 'Map' has been proposed in Lendaris (1980) as a tool of structural modelling which consists of 'elements' and 'connections'; the 'elements' are, either intermediate or final, states of knowledge; the 'connections' are refinement processes (called steps) which lead one from one state to the next. In Lendaris (1980) three kinds of activity may occur in each step:

- an additional assumption is made (!),
- further information is added (?), and/or
- an algorithm or operation is carried out (*).

The Map organizes states of knowledge (the different Schemes) which are essential at the different change process structuring stages (see figure 1).

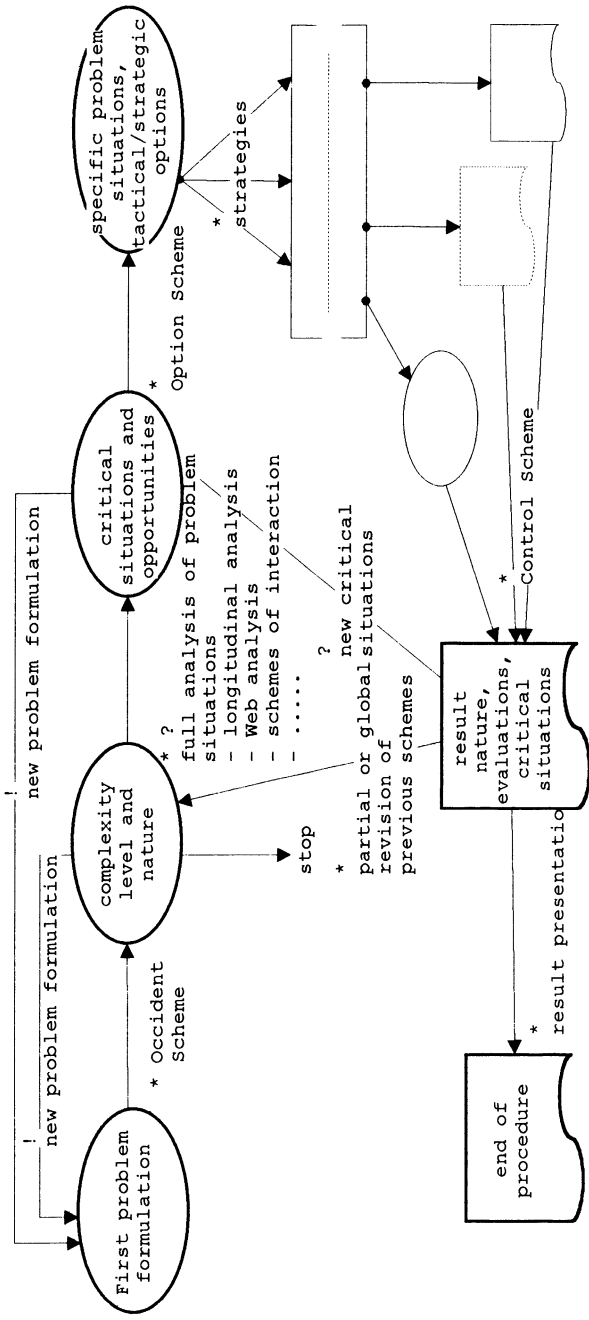


Figure 1 The system and the main procedure passages.

From the first problem formulation the team proceeds to *recognizing the level and class of complexity* to be faced by the first Multidimensional Scheme of Organizational Change Complexity Identification (OCCIDENT Scheme). A collective definition of the Scheme elements helps verify whether the team presents the necessary competences, which includes all the key roles and functions, and, whether it can operate cooperatively.

Some typical classes of complexity are related to specific methodological approaches and techniques. If the situation appears too complex to face the team may ask to interrupt the procedure; in some other cases, when the situation is not sufficiently characterized, a new problem formulation may result to be essential to reduce ambiguity, incoherence or incompleteness.

When the recognized complexity is acceptable and clearly characterized, a full analysis, using the support of specific techniques, may reduce the identified critical conditions. The Occident Scheme can evolve in relation to the analysis results and may require a new problem formulation or induce the passage to a second Scheme, called the Option Scheme. This tool is applied to a *collective and detailed definition of specific problem situations* and then to consistent *development of tactical/strategic options*, for a collective assessment and /or selection.

The results from cognitive, tactical and strategic activities are integrated and evaluated using a Control Scheme which concludes a procedure cycle. This Scheme allows the *verification* of time and resource constraints, the *examination* of process development and actor involvement, and the *assessment* of prefigured results. The control nature is closely related to the chosen and implemented strategy; a Control Scheme has to include all the significant elements in a formal structure that is easily readable and suitable for transformation into an evaluation model.

New steps are activated in relation to the collective analysis of the previous results by the Control Scheme. They may require the partial or global revision of the previous Schemes to collectively identify ill-judged elements of complexity and problem situations and to explain strategies that have resulted to be not operative, not effective enough or problematic. New critical situations may be proposed as the object of a new Option Scheme development.

Final or temporary evaluation and acceptance by the team leads to result presentation and can cause the end of the procedure.

3 SCHEMES AND SUPPORTING TOOLS

3.1 The Occident Scheme

The Multidimensional Scheme of Organizational Change Complexity Identification is a tool that is applied to recognize change as being multifaced and to express different actor's points of view about change complexity (Le Moigne, 1985; Pettigrew, 1990), to identify these complexities collectively, at least in general terms, and to characterize the main elements of risk which have to be analysed and reduced before any new change process step.

Multiple elements concur to define organizational change complexity. The main points of view proposed in literature and here recognized as significant and sufficient to elaborate a complete and operative framework are synthesized in the Scheme. They are related to three dimensions, *change nature*, *complexity characteristics* and *problem situation*, which are articulated in nine criteria, each of which joins to different qualification states (Roy, 1985;

Vincke, 1992). In figure 2 nine axes represent the criteria and their qualification states. Combinations of these states (one for each criterium or attribute) identify change profiles at different complexity levels.

Change nature

Organization change form and diffusion and temporal and spatial characteristics globally define the change nature. Different forms are identified, as in Van de Ven (1986), in relation to the main involved organization variables; the types of diffusion are expressed in functional and contextual terms, as analysed in Kling (1987); processual structures and spatial characteristics are defined in relation to the distinction between drastic and incremental, strategic and peripheral change; between the outer and inner context of the organisation; between the contextual situation and the focal situation (see for instance Pettigrew, 1990; Kling, 1987 and Le Luarn, 1989).

Complexity characteristics

Different complexity forms (orientation, understanding and decision complexity) characterize the change process. Elements of a reference system (points, coordinates and categories) allow the course of action to be oriented; the nature and conditions of this reference system induce different complexity states. Information elements on the organization and specific change can be globally or partially lacking and may require specific inquiry activities. The decision system nature and uncertainty of the involved actor's behaviour must be identified, at least in order to compose an operative management group that is consistent with the decision complexity level.

Problem situation

The nature of the environmental stimuli to change and the perspectives on action in organization characterize the problem situation that develops in relation to change. External and internal critical factors can generate a crisis situation, positive stimuli and internal interests can generate opportunities (Mintzberg, 1976; Pettigrew, 1990). In the "situational control" perspective external factors or events constrain or force people and organizations to behave in certain ways; in the "rational actor" perspective, people and organizations evaluate alternative courses of action and exercise free rational choices. In the "emergent" perspective on action, the behaviour of people and organizations emerges from a dynamic interaction of external circumstances and internal motives of interests (Pfeffer, 1982; Markus and Robey, 1988).

3.2 Supporting techniques

When the change complexity is recognized by the Occident Scheme as being globally acceptable, a full analysis can reduce critical marginal conditions and allow more detailed characterizations. Specific techniques may be activated in an approach which is contextualist and processual in character, 'to draw on phenomena at vertical and horizontal (processual) levels of analysis and the interconnections between those levels through time' (Pettigrew, 1990).

Methodological approaches and tools have been proposed in literature, to operationalise these concepts in actual change processes (Walsham, 1990) They consist above all of the Kling's Web Model (1987), for the analysis of the social and technological change context, methods of longitudinal field research (Van de Ven and Huber, 1990), to analyze and interpret process patterns in longitudinal data collected in the field, schemes of interaction between the

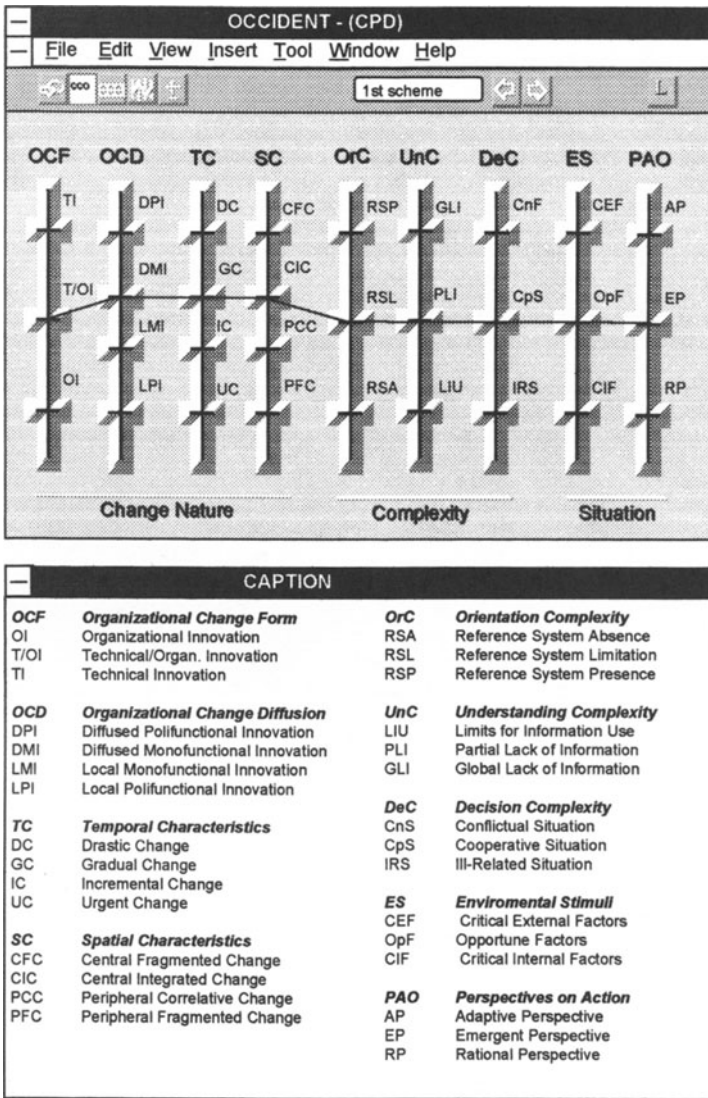


Figure 2 Occident Scheme.

level of action/process and the level of context/structure, suggested by Orlikowski and Robey (1991) as a framework based on Giddens' structuration theory (Giddens, 1984), methods of problem structuring (Bowen, 1983; Rosenhead, 1989), to reduce difficulties in problem formulation and to help members of the team to negotiate their views of the problem and a

consensus for action (Eden, 1988). Classical Operations Research techniques can be used in relation to more structured problem elements. These tools have to be integrated into the system and activated in relation to specific profiles/classes of change complexity.

3.3 Option Scheme

The Option Scheme proposes a more detailed analysis of identified critical situations and translates the knowledge of specific problem and the team's action context into operative terms. It helps reduce the tendency to examine too few points of view and scenarios (Huber, 1984), both in the initial phases of the change process and then when specific problem situations become evident.

This scheme presents a bipolar structure which allows both the problem situation to be described in detail and the problem solving options to be collectively identified, or elaborated, and examined. The same modular structure characterizes and integrates the two technical actions. The problem situations can be described in the first part by two dimensions, the *political-organizational* and the *technical-organizational* dimensions, which are able to synthesize knowledge from the Occident Scheme development and results from specific inquiry and structural analysis actions (see 3.2). *Operative* dimensions, in relation to the previous problematic dimensions, define the structure of the suitable courses of action in the second part of the Scheme. One or more tactical and strategic option can be identified in the organization memory (Mintzberg et al., 1976) and/or elaborated by the team's competences. The Scheme operative dimensions support the option structuring in formal, operative and instrumental terms and, if necessary and significant, allow a multicriteria evaluation and selection of multiple options (Vincke, 1992). Attributes and criteria are developed, in relation to the significant dimensions and qualify specific difficulty situations, in the first part of the Scheme, and local solutions, in the second part. The multidimensional structure makes a collective definition of possible options more complete, easier and analytical. The team's negotiating activities can be oriented towards specific elements of problem and/or option definition, that is, towards attributes-criteria or specific qualification states instead of global alternatives, to find terms of agreement and to reduce ambiguity and conflictuality.

The Option Scheme component parts are strictly related to the specific change process step and to its critical situations and possible solutions. Some qualification attributes and criteria are frequently proposed in literature and recognized as often being useful in the analysed cases, but a general structure, that is able to face different situations, does not exist. An example of Option Scheme use is described in the next section.

3.4 Control Scheme

A Control Scheme concludes each procedure cycle, integrates results from all the different activities, validates and evaluates them. Control nature changes together with the process development and is oriented towards a collective analysis of previous results in conceptual, logical, experimental and operational terms (Landry et al., 1983).

A Control Scheme should include all the significant elements of a procedure cycle in a formal easily readable structure that can be transformed into a multicriteria evaluation model (Roy, 1985; Vincke, 1992). This model presents the same structure, during each process phase, and different specific criteria, such as consistency, accuracy and completeness,

reliability, compliance with requirements and usefulness, timing, economics and resource consumption, outcome nature, process nature and organizational effectiveness, and so on.

4 AN APPLICATION

A new organism (CPD) was created at the Politecnico of Torino in 1993 and definitively installed in 1994 to coordinate different activities and improve educational services. CPD consists of sixteen members who represent three faculties and are equally divided into eight teachers and eight students. In the first year four committees are appointed for special functions: Statistical study of secretary service data, Questionnaire on the courses, Quality parameters and Student information.

The introduction of this organism into university contexts may be seen as an element of organizational change which, using Mintzberg (1983) terminology, is oriented towards an evolution from a *professional bureaucracy* to a mixed model, with elements of *adhocracy*, *divisionalized form* and mainly *machine bureaucracy*.

Change complexity has been analysed with the president of this new organism. The first analysis took place at the beginning of 1994 and mainly dealt with institutional documents. An Information Technology change process is also in progress at the Politecnico and the two processes are inevitably interconnected. A Web Analysis (Kling, 1987) has been developed to identify the essential elements of these change contexts and some critical elements have been identified in the CPD access to data, mainly from a technical point of view. An Occident Scheme which characterizes the initial complexity as being very limited is presented in figure 2. The profile is in fact nearly 'flat' and the medium positions on each axis represent the less crucial states.

In 1994 CPD became a valid interlocutor for the university governing organisms but some conflictual actions had been developed against CPD. Change complexity may be underestimated both in the Occident Scheme and in reality.

The previous Web Analysis was brought up to date in 1995 and a longitudinal study of the first years of work detailed actions, at individual and institutional levels and their interactions.

In the up-to-date Web Analysis some relationships between CPD and other actors changed. Some of these were lost, while some became very strong; there were some new involved actors and the roles and functions of others changed. Technical problems concerning access to data were also present but some possible solutions were preliminary being tested.

The situation seems to be evolutive from a historical point of view; CPD role and main functions were not fully understood at the Politecnico during the first explorative and explicative phase in 1993; when CPD looked for resources some involved actors recognized the change process nature and reacted at an institutional level as they were afraid of losing autonomy, and at an individual level by refusing access to parts of the global Information System. As a consequence CPD orients towards a wide information diffusion of its actual functions, to reduce the negative impact of the reaction.

The global situation is now more critical than the first Occident Scheme represents. The evolutions in the global situation require a new complexity analysis. The second Occident Scheme (see figure 3) presents a more irregular profile in relation to the *Decision complexity* (*conflictual* and not *cooperative*) and to the *Spatial characteristics* (the change is *central*, that is, it includes vital functions in the organization, but is *fragmented and not integrated*, because the key areas at the Politecnico are poorly correlated in relation to the involved functions).

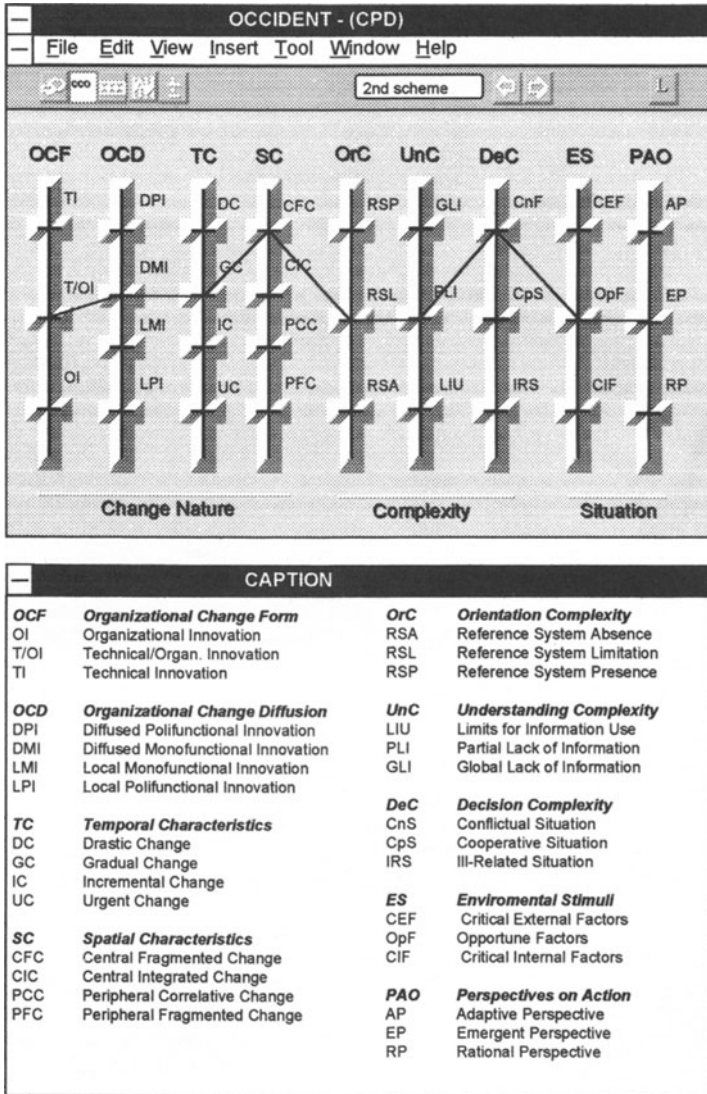


Figure 3 The second Occident Scheme representing the situation at 1995.

Results from the different analyses allow an Option Scheme elaboration. Three problem situations are described, by attributes, in the first part of the Scheme. "Data acquisition and interchange" is the first problem, which is mainly of a technical-organizational nature; two

attributes formalize the Web Analysis identification of this critical situation: *code difficulties* and *Data Base typologies*. In relation to this problem, the second part of the Scheme proposes an operational dimension, through three attributes/criteria, to analyse and evaluate (if necessary) the different possible solutions in terms of *cost*, *timing* and *effectiveness* (see figure 4).

The other two problem situations, "Organizational relationship" and "Results from CPD actions", are mainly of a political-organizational nature. Three attributes describe the level and nature of the difficult internal relationships (*full relationship activation*, *contact activation*, *collaboration between CPD and local committees*) and four attributes/criteria allow some operational solutions to be defined and analysed, in terms of *new cooperative context need*, *action operational level*, *structuration modalities* and *problem disaggregation level*. The results are described through four attributes (*detailed structuring of course programmes*, *programme documentation*, *exam coordination and activation of local didactic committees*) and four attributes/criteria allow some options to be formally elaborated and assessed, in terms of *user involvement* and, as for the previous problem situation, *new cooperative context need*, *action operational level* and *problem disaggregation level*. Possible solutions to these two problem situations have to be analysed separately and then they may be integrated by a collective action of structuring (Friend, 1989).

The Option Scheme is now under examination in the CPD Committees as only the president has been involved in the Scheme elaboration and analysis. A collective context of Change Analysis and Management must be created inside the CPD.

5 CONCLUDING REMARKS

Ill-structured problems, such as multiactorial and multiorganizational problems connected with the management of new ideas, procedures, technologies and so on, require specific emphasis on the activities of conceptualisation and problem definition (Sol, 1985). Change complexity knowledge, in terms of context, process and content of change, creates greater communication and collective action possibilities, oriented to the detailing of problem situations, making decisions, implementing them and to controlling their implementation.

Different methodological and conceptual indications have been proposed in literature to reduce project failure risks and to create an actual change culture. This knowledge implementation requires a global framework to guide human and institutional action without limiting the process development.

The framework proposed in this paper, tries to include all the main indications from literature in a system of structured Schemes which adopts a Multicriteria approach (de Montgolfier and Bertier, 1978), that connects the possibility of using methods (mainly multicriteria methods) with a specific way of acting on the representations and allows courses of action and procedures that are sufficiently elaborate to deal with complex situations and sufficiently free from structural limits. These procedures help actors translate facts, proposals, points of view and preferences into formal models where mental, written and numerical data, from different sources, are organically synthesized and easily "linkable" to the proposing actors and context and process conditions. These models can be activated and used in different phases of the process without a substantial change of structure; they evolve, induce different results and can be combined in several ways, always using the same language.

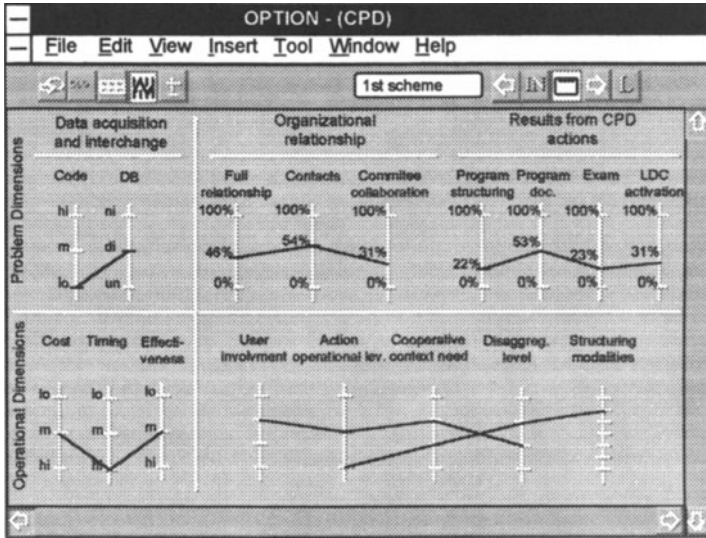


Figure 4 Option Scheme.

The system and its Schemes are now used as a support for two technological and organizational change processes. The essential target for the future is to test Schemes and procedures in actual different situations. The basic structure of a prototype system, designed by the same approach adopted in (Buffa et al., forthcoming), is now being implemented. Using QuerySys, a new generation windows-based full text retrieval environment (Marzano et al., 1993; INSIEL, 1993), the system can integrate three different paradigms of data management: DBMS for processing structured data, information retrieval for processing full text data and hypertext for browsing and linking different *chunks* of information. The experience acquired by manually using the procedure, when data and human knowledge are limited, will improve both the change support possibilities and data base and the model base management by a system, when manual use becomes difficult and time-consuming.

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