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# Organizational Relations analysis and Information Systems design: a proposal and an application.

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## Abstract

This paper proposes a IS (Information System) design method based on the analysis of the system's organizational impact. Three organizational aspects are considered: (i) the analysis of decisional requirements of managers, (ii) the changes the DSS causes in users work habits and (iii) the changes the IS causes in organizational power equilibrium. Whereas points (i) and (ii) can follow existing literature, for the political changes problem instead, the paper proposes a new method based on the analysis of the **network of relations** existing in the organization. The analysis of organizational relations overcomes some of the limits of the classical organizational perspectives to political analysis of IS introduction. Moreover the paper presents an application of the proposed method regarding a service in a public health agency, in which the relational approach to organizational analysis gives good results.

A longer version of this paper, with an application of the proposed method, is available by the author.

## 1. Introduction.

This paper proposes a IS (Information System) design method based on the analysis of the system's organizational impact. The aim of the proposed method is the joint design of the IS and of the Organizational Changes required for its use. In particular the paper examines the design of IT tools for supporting management decisions (Management Decision Support Systems).

The tight link between technical change and organizational change requires the capability to jointly design the technical system and the organizational system. This paper proposes for the joint design of an IS a method based on three main components:

- (1) the analysis of **decisional requirements** of managers,
- (2) the analysis of the changes in users' job and work habits, caused by the new tool (**job changes**) in order to avoid unacceptable work patterns and to reduce resistances to the new tool,
- (3) the analysis of changes in power equilibrium, that may cause a resolute opposition to the system (**political changes**).

The first two components of the design method -the analysis of manager decisional requirements and of work habits changes- can be realized according to literature about Information Systems design and Organizational Change. They address problems regarding for example: the bounded rationality of the decision actor, the presence of uncertainty, the differences in user's individual preferences, the presence of tacit knowledge, the need of adaptive rationality, etc. (Ives and Olson, 1984; Ciborra, Migliarese and Romano, 1984; Heiner, 1983; Davies, 1992; Polany, 1966; Argyris, 1982; Grudin, 1989). For these two components various conceptual background and operational methods are thus available.

## 2. The relational perspective to IS design.

For the political changes problem instead, the paper proposes a new method based on the analysis of the **network of relations** existing in the organization.

This Relational Perspective is presented as an alternative to the two classical perspectives for organizational power analysis: the transaction costs theory, limited only to economic kind of interactions, and the organization power perspective, that is too deterministic as it foresees the use of power whenever there are different interests.

In last few years some authors have used the Network Analysis for analyzing organizations (Nohria and Eccles, 1992): organizations are conceptualized as composed of **nodes** linked by **networks of relations** (Tichy, 1991).

Several criteria may be defined for the location of **nodes**: formal borders of organizational units, similarity in technical activity, equality in hierarchical position, similarity in professional qualification, etc. For the purposes of relational analysis, the best criterion is the relational homogeneity of nodes, so that all the components of a node have the same set of relations with every other organizational actors (Baker, 1992).

Each node is linked to the other nodes through a set of **relations**.

The word "relation" was firstly introduced in organization theory by Elton Mayo and his Human Relations school. Even if nobody can deny the importance of this school in organization studies, the concept of relation was used here with a limited meaning: (1) only interpersonal relations are considered; (2) the analysis is centered on the organizational climate, whereas the relation remains only on the back.

Some authors (Gabarro, 1990; Granovetter, 1992; Ferioli and Migliarese, 1994) have proposed the concept of relation as the basis for organizational analysis. But here the relation describes the link between two organizational actors according to several dimensions (Donati, 1991) and it may be considered as an extension of the economic transaction concept also to interactions of other types (such as social links, technical interdependencies, psychological interactions, etc.) (Migliarese and Ferioli, 1995).

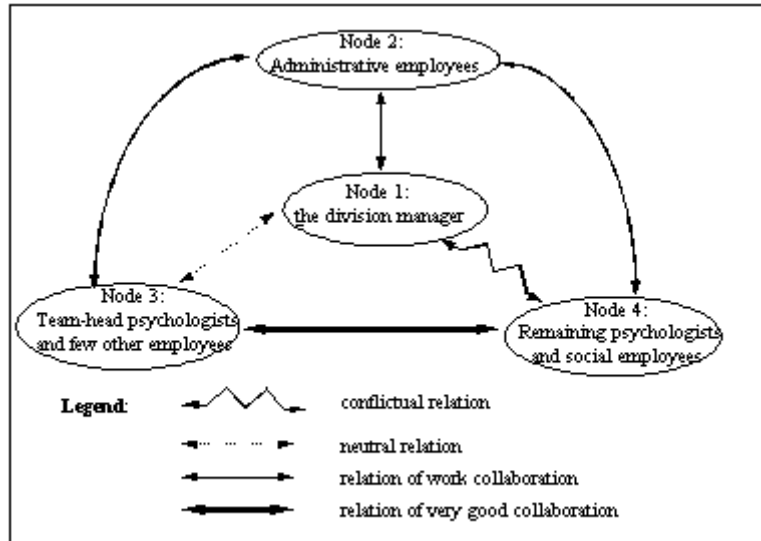
The proposed relational approach suggests to look at the several dimensions of the relation linking the nodes.

For example a subordinate may be linked to his supervisor through: (1) a hierarchical tie, (2) a psychological link (esteem of supervisor expertise), (3) a technical interdependency (interdependencies in work activities), (4) a social interaction (due to friendship).

The analysis of the set of dimensions of the relations among the nodes (i.e. the analysis of the network of relations) enables the prediction of the behavior of each node toward the other ones.

A **method** for supporting the analysis of organizational relations has been proposed (Ferioli and Migliarese, 1994; Ferioli and Migliarese, 1996b). This proposed method suggests to break down the relation into its four main components: tools, goals, rules and cultural background.

## **Tools.**



**Fig. 1-** The revealed pattern of organizational relations in the socio-psychological department

The tools indicate the instrument that enable a relation to exist. Different kinds of tools can support an organizational relation: for example tools of the previously described subordinate-supervisor relation are the hierarchical tie, the psychological esteem link, the technical interdependency, the friendship interaction, a possible computer network.

### Goals.

The goals explain the organizational purposes that justify the establishing and maintaining of an organizational relation. The presence of a shared goal is the *raison d'être* of the organizational relation.

### Rules.

The rules and norms define the set of implicit as well as explicit rules that govern relations.

Relational norms define the accepted behavior: in this way they allow/prevent the integration of (new) actors in the group created through the relation.

### Cultural background.

The cultural background is composed of the organizational culture common to the two economic/organizational actors involved in the relation i.e. the values, the traditions and the customs the two actors share. The cultural background forms the base knowledge shared by the actors of the relation, i.e. the common assumptions that do not require any negotiation or contractual definition (Schein, 1984).

The analysis of existing pattern of organizational relations among the actors as well as the new organizational relations induced and forced from the use of the new IS, could make evident contradictions and disruptive conflicts. This suggests a change in the IS design in order to avoid ineffectiveness and failure of the system. The design of the Information System could be modified in order to arrive at one of the two possible solutions:

- (i) restoring the original equilibrium (technical facilitation),

(ii) designing a system and a new pattern of organizational relations (new solution of organizational relations).

At the end of the IS design the final IS has to be coherent and compatible with the acceptable pattern of organizational relations.

### **3. An application of the proposed relational method of organizational analysis**

An application of the method is regarding an IS design process, conducted by the author, for the socio-psychological department of an Italian public health agency. The initial version of the information system was designed only on the basis of managerial requirements of reporting and control expressed by the head manager. But the analysis of the organizational relations using the proposed method revealed the existence of four "nodes" (the manager, the administrative employee, the heads of the socio-psychological teams and the teams itself) and of different patterns of organizational relations (work collaboration, neutral relation, very good collaboration, conflictual relation) (Fig. 1).

Various problems and contradictions were discovered with respect to the first IS version: 1) the refusal of the IS by the socio-psychol employees due to their poor computer expertise; 2) the contradiction between the heavy data-entry required to these personnel and the absence of direct benefits; 3) the intensification of hierarchical control, perceived as only bureaucratic.

These revealed problems lead ultimately to a strong modification of the IS itself and of the design process:

several design meeting with user participation were established during the design process;

suggestions regarding system features from administrative and socio-psychological personnel were accepted;

special PC training was forecasted for the users;

the IS was changed from a reporting and statistical like initial tool also to an IT based tool for socio-psychological team-work support.

The analysis of organizational relations lead to a significative modification of the system and finally to a successfull realization and implementation of the Information System.

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