

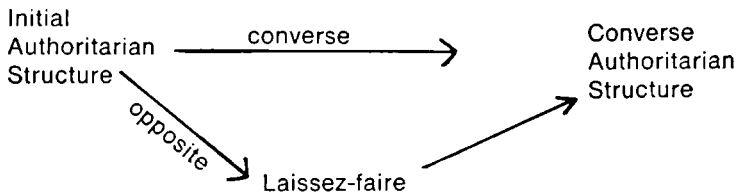
# Non-Hierarchical Forms of Organization

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Processes of social change often move from a given state to its opposite or to its converse. Moving in any of these directions the transformations achieved remain contained within the logic of the given.

Moving out of an authoritarian structure which has become discredited, obsolescent or inefficient a transition may occur to a converse authoritarian form. Alternatively, if an authoritarian structure becomes simply eroded, as happened in the Victorian middle class structure of parent-child relationship, then a transition may go to its opposite, a laissez-faire relationship. From here a transition may occur at the next stage to an authoritarian form in new institutional settings such as para-military youth movements. Changes of this type are shifts within an essentially one-dimensional conception of society. It is more difficult to find and achieve a fourth alternative which is neither authoritarian nor laissez-faire and which lies outside the logic which generates this type of process cycle. (Fig. 1.)



*Fig. 1. The Process of Social Change is Locked within the Logic which Generates the Organizational Structure*

In much the same way, transition from a pattern of competitive individualism within an academic community may take the form of establishing the opposite, which is making group decisions on all issues.

In the case of bureaucratic hierarchical organizations, an attempt to move out of this system may be perceived as going in the direction of the opposite, that is, a chaotic unstructured state. Alternatively, transition from say a centralised to a decentralised system produces the converse without necessarily changing the basic mode of operation of the organization.

There has been a view that a hierarchical organization is the only possible form of organization. This would be true, if each of the component parts are restricted to a specialised function. In this case a single structure of hierarchial levels is generated to coordinate the functioning of the specialised parts.

The alternative argument has been that since each element is part of a larger whole, which is again part of a larger whole, and so on, a pattern of hierarchical domination is inevitable. This assumes that part-whole relationships is the only way in which elements can be related to one another.

Here again then, the process of social change can become locked within and unable to go beyond the inherent organizational logic. The steps required to find a way out, are to

- (i) identify the basic assumptions which generate the organizational logic,
- (ii) search for an alternative set of assumptions,
- (iii) derive the characteristics of alternative types of organizations.

The basic assumption which generates bureaucratic hierarchical structures is that each member is restricted to a single specialised task. As a result, a single structure of hierarchical linking relationships is established within which the functioning of each level is controlled by the next higher level.

If the one man-one task principle is abandoned, then the requirement for a hierarchical organization disappears, and what results are organizations which instead of having a single rigid structure of relationships have the capacity for multistructured functioning. (Fig. 2.)

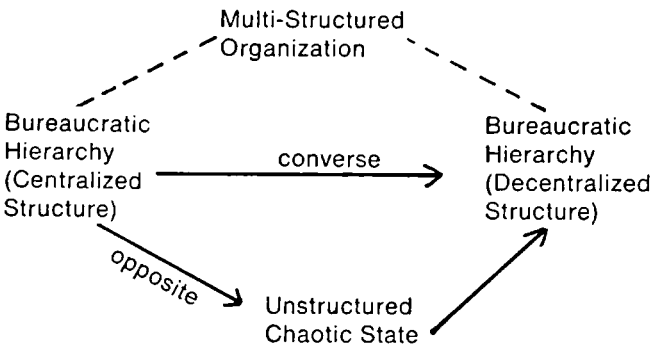
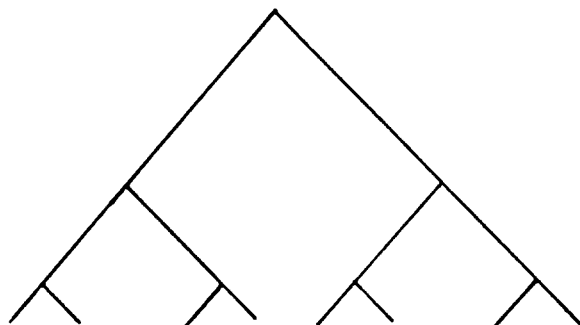


Fig. 2. Identification of a Fourth Alternative

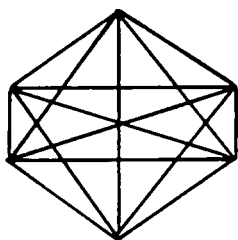
The first case of an alternative type of organization which was studied in some detail is the composite autonomous group. This is based on the principle that each member is able to carry out all, or at least most tasks. More recently it was discovered that if the principle is adopted that each member has a specialist function, but at the same

time an overlapping competence with other members, then what is generated is a matrix organization. Figure 3 shows the type of organization generated by each of these design principles.

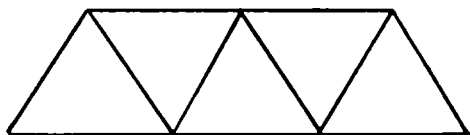
*Fig. 3. Alternative types of Task Allocation which Lead to Different Types of Organizational Structures*



*One man - one task*, generates a single structure of hierarchical levels.



*Each man - all tasks*, provides the conditions for a composite autonomous group, and allows any structure of work relationships to be utilised.



*Each man has an overlapping competence with other members*, provides the conditions for a matrix organization. In the above case, each man is capable of carrying out three different tasks. This type of organization has a basic structure, but at the same time allows a variety of possible work relationships to be utilised.

The study of non-hierarchical organizations of this type shows that these have the capacity for functioning by way of directive correlation of the activities of members who may be working independently or in smaller subsets. That is, although members may work independently for shorter or longer periods, the work of each supports and facilitates the work of others in the direction of the achievements of a joint aim.<sup>1</sup> This makes it possible to identify the operating principle of a network in which members may be geographically dispersed and have no form of direct control over one another.

In the following we shall discuss the characteristics of composite autonomous, matrix and network organizations, first at the level of small groups, and then consider the feasibility of these types of organizations at the level of larger social units.

The common characteristics of each of the different types of non-hierarchical organizations is

1. the capacity for multi-structured functioning,
2. the capacity for achieving and maintaining directive correlation of on-going activities.

Each of the non-hierarchical types of organization points to the possibility for developing organizational relationships which not only permit but also support the individual autonomous development of members, going beyond the choice between the Scylla of competitive individualism and the Charybdis of collectivistic and authoritarian solutions, thus avoiding the sacrifice of the individual to the over-riding needs and demands of a social system.

Historically, the first non-hierarchical type of organization which was discovered and described in some detail is:

- (i) *The composite autonomous group.* Within this type of group all members are capable of carrying out all or at least most tasks. The members of the group being equipotential, none has a special leadership function. The special characteristics of this type of organization is that it has no specific structure but can adopt any temporary structure which is judged by the members to be appropriate at any one time. Thus, there is no necessary requirement for all members to work together on any task or to make group decisions. They may at any one time each work individually or in subsets. However, the requirement in this case is that the activities of individual subsets of the group remain directly correlated towards the joint achievement of a specified aim. The requirement that all members are able to carry out all tasks has as a consequence that the required competence range for the total task will need to be within a feasible range. The size of the group is generally relatively small. However, there are examples of linked sets of autonomous groups which can operate as a unit of up to forty persons.

<sup>1</sup> The concept of directive correlation was formulated by Sommerhoff (1950). Its relevance to the study of social systems was pointed out by F. E. Emery (1967).

- (ii) In a *matrix group* each member has a specialist function but each has an overlapping competence with some other group members. In this case there is a structural constraint. At the same time a large variety of alternative structures can be generated and utilised depending on task requirements. The special characteristics of the matrix group is that as far as the design principle is concerned there is no necessary limit to the size of the group. However, there is no practical experience so far which might indicate the approximate limits to a viable group size. The design principles for this type of organization was initially theoretically formulated, and it is only quite recently that an implementation has been carried out on board a ship. This does not mean that matrix groups have not existed in the past without having been recognised. A recent study has shown that some of the characteristics of a matrix organization have been traditionally evolved in at least some banking branches.
- (iii) A *network group* can be described as the converse of an autonomous group. The members of a network are normally dispersed individually or in small subsets. It is only infrequently that they come together as a joint group in a work session and for direct communication. In an autonomous group on the other hand, the members normally work in close association with one another and network type properties emerge in the work situation only temporarily and for shorter periods, whenever the group splits into smaller subsets in carrying out its task.

The basic characteristics of a network is the maintenance of long term directive correlations, mutually facilitating the achievement of a jointly recognised aim. The project of this type of organization is typically to find ways of going beyond the established given. As an organization it provides the maximum autonomy of individual members consistent with and under some conditions optimally suitable for the achievement of a joint aim.

There are several reasons why organizations of this type tend to remain relatively unrecognised for long periods. Taking the case of a network of scientists as an example then

- (i) Communications may be in the available literature but its significance may initially only be visible and actively responded to by relatively few others.
- (ii) The aim may to begin with only be quite vaguely specifiable and possible means of implementation may to begin with be quite tentative and unclear to the network members themselves. The joint task and commitment of network members becomes that of working towards the clarification both of the aim and means of implementation.

- (iii) A web of directive correlation is scarcely ever visible from the outside and may also to the participants become recognisable in its structure only in retrospect. It is not simply a matter of information flowing more easily within the network.

The type of process which occurs is that the contribution of member *A* may be recognized as an innovative step by member *B*, who may be able to take this further in his own work. This again may help *A* to see further implications. In this way a cumulative process within the network may lead to a new approach to a problem which is a joint product of the group. At the same time, approaches which show themselves to be inadequate can be rapidly modified or abandoned. The absence of individual status striving by individual members is a critical factor in being able to abandon or modify unproductive approaches. In this way the primary function of a network is the development and maintenance of a joint learning process, and its productivity depends on the actual or evolving complementary skills of its members. Both in the nature of its task, its mode of organization and its process of functioning, a network is possible as far removed from a bureaucratic hierarchical organization as it is possible to get.

Although network groups may maintain their existence over some decades, they are in principle temporary systems. As such, members will normally maintain their role in more conventional institutional settings. In this case the linkage between different institutions may become a correlated function, which at the next stage points in the direction of a network organization in which the nodes are institutions. A network group, as its task becomes completed, that is as its approach becomes converted into a new established given, may become institutionalised as some kind of professional society, or the members may disband and move towards new fields.

Each of the types of organization discussed, have existed for some time, however, they have generally been either unrecognised or exceptional. Known actual cases at this time, whether discovered as naturally evolved forms or achieved by design implementation, are on a small scale. A study of cases of this type was essential to gradually developing an understanding both of the basic design principle and the mode of functioning of organizations of this type. Table 1 gives a tentative overview of the characteristics of non-hierarchical organizations at the group size level. One of the basic differences between bureaucratic hierarchical and non-hierarchical forms of organization will be seen to lie in the fact that bureaucratic hierarchical organizations are based on the principle of a single rigid structure, while each non-hierarchical form of organization has the capacity for multi-structured functioning.

*Table 1. Types of Group Organization*

	Bureaucratic Hierarchical	Composite Autonomous	Matrix	Network
<b>Task Structure</b>	Product (P) procedures ( $\pi$ ) and input state (I) are given by specification $\pi(I) \rightarrow P$ or assumed to be reducible to this form in terms of given norms and rules	Product is specified. Input states are specifiable but procedures are not, or a requisite choice exists $?(I) \rightarrow P$	There may be a variety of products. $?(I) \rightarrow P$ or $?(?) \rightarrow P$ Procedures and possibly input requirements are not specified.	Neither initial nor outcome state are specified in operational terms $?(?) \rightarrow ?$ The task is to achieve a more specifiable task structure
<b>Task Competence Range of Members</b>	One man – one specialised task	Each man – all tasks	Each man has a specialised task together with overlapping competence with other members	Overlapping competence range of members
<b>Organizational Structure</b>	A single specified structure of relationships	Can adopt any type of temporary structure depending on recognized task requirements.	A basic structure is given by the pattern of overlapping competencies but within this a variety of structures may be adopted.	Sets of members may and generally do engage in joint project work for shorter or longer periods. The structure is given by the web of directive correlations
<b>Basic Principle of Organization</b>	Parallel and independent activity of contiguous members. Regulated by specified activity programs and normative rules.	Mutual facilitation of contiguous members in direct interaction with one another. Joined and shared responsibility. Short term directive correlation when members work in smaller subsets.	Intermediate between composite group and network. Members work predominantly in smaller subsets and the pattern of all working together on a task is less frequently adopted.	Long term directive correlation of dispersed members. Selective interdependence.
<b>Feasible Size</b>	No apparent limitation to the subordination of parts.	Sets of autonomous groups linked by rotation of members are possible. The possible use of this type of organization for larger scale units needs to be further investigated.	In principle there is no limit to the size of a matrix, however, the problem of viability has not yet been investigated. At the next level a matrix in which organizational units are components appears to be possible.	Network groups are limited in size. A network of networks appears to be possible. The main utilization of this type of organization lies in the development and maintenance of directive correlations of organizations involved in a long term change process.

	Bureaucratic Hierarchical	Composite Autonomous	Matrix	Network
Environmental Suitability	The assumption is that the environment including human beings both can and should be converted to and maintained in a highly predictable form.	While means – end relationships may remain basically predictable, operational conditions may be subject to marked variations. At the same time autonomous groups have a capacity for both technical and organizational learning.	The conditions may be such that a number of aims needs to be achieved in a coordinated way. At the same time a shift of aims can lie within or not too far beyond the adaptability range without requiring basic change of the organizational form. The matrix organization provides in this case a balance between structural constraints and flexibility.	In their original form network groups were established to tackle problems outside the established given. At present their relevance lies in respect to mildly turbulent environments. Their stabilizing structure lies in the fabric of directive correlations. Matrix organizations are appropriate for production tasks. Network organizations are appropriate when a number of different organizations become involved in a relatively continuous and long term change process. Their basic characteristic is that the research function becomes incorporated and dispersed within the organization. It is at this stage that the traditional role of academic and research institutes with exclusive property rights to the research function is no longer appropriate.



The problem at present is that of investigating the relevance and feasibility of the design principles for larger social units. There are at least two ways of proceeding:

1. If a change of scale occurs due to growth, than just as it is possible to develop larger bureaucratic hierarchical organizations with organizations of the same type as components, so it may be possible to, say, develop a network of networks.

Alternatively

2. The constituents of a matrix or network instead of being individuals, may be organizational units of different types.

There is insufficient experience so far with the possible utilisation of autonomous groups as building blocks for larger units. There appear to be two possible problems:

1. The requirement that members are capable of carrying out all or most tasks restricts the size of individual units.
2. Autonomous type groups have for the most part been implemented within the structure of existing hierarchical type organizations, specifically in bottom-up change strategies, and thus built at least temporarily into an at least partially inconsistent context.

The approach which has been found specifically appropriate for large scale units is the network organization. This type of approach was in fact utilised from the beginning in the Norwegian Work Democratization project. To see its significance what is needed is a figure-ground reversal.

Organizational networks may in much the same way as project groups be utilized to implement changes somewhere else. In this case they function as adaptations of a fundamentally bureaucratic structure. Their mode of functioning as a nonhierarchical organization is quite different.

An example is the type of organization which has evolved in a project concerned with working towards a new form of organization on merchant ships, which initially was concerned with the development of an autonomous type group for the subordinate crew and more recently developing a matrix group of officers. A change of this type, requires as it proceeds a change in headquarter organization, a change in maritime schools which involves the Ministry of Education, changes in certification and regulation, changes in trade union structure and functioning, in the process and direction of technological architectural design, and changes also in the role of the researchers involved.

The implementation process, which involves changes in the mode of functioning of each of the constituent organizations and also in their relationships to one another, is almost precisely the same as that descri-

bed previously for the little network group. The project is to go beyond the established given. The aim to be achieved finally cannot initially be specified in detail. The initial time horizon may be 10–15 years. The project is such, that no organization by itself can go ahead very far on its own, since it is linked to the other organizations involved by interdependence and complementarity relationships which become manifest in the change process. The major difference as compared to the informal network group is that while interdependence relationships of the latter are a result of selective interdependence, the initial structure of interdependence relationships is given by the nature and scope of the change process.

Given in the present case an initial joint commitment of the organizations concerned for initial exploratory steps in the direction for change accepted, a representative committee was formed which then constitutes the formal core of an evolving network group. Taking to begin with exploratory steps for changing the organization on board project ships, provisional facilities for additional education of officers for a matrix organization was required. With the agreement to go further, a new structure for maritime education has been established which affects both career paths and certification requirements. What becomes visible now, is that while before the captain had to be recruited via the deck department, he can now be recruited from any member of the matrix group. To implement an extension of the new form of organization, what needs to be explored at head office and the development of new types of relationships between head office and ships. At the same time, ship personnel has been involved in the design of new living quarters which have been implemented providing saloons and restaurants for the total crew, and a raise and equalization of cabin facilities thus removing one of the traditional supports of the earlier segmented, hierarchical status structure. The extension of the number of project ships has at the same time led to a diffusion network between different shipping companies. At a later stage, a need for the change of the trade unions, which are at present based on the traditional work roles may become recognized.

What is meant by a figure-ground reversal in the present case is that the initial object of change becomes at the next stage a means for the transformation of the larger social system. Within this process, each of the participant organizations is able to change itself adaptively in relationship to other participant organizations. Within the organizational network, the process of change moves along the lines of a gradually evolving fabric of directive correlations. Each implementation step becomes subject to evaluation, and after each step new steps forward may become visible and subject to exploration. In this way a continuous learning process is developed and maintained within which theories and guiding hypothesis become evolved and modified in a constant confrontation with the empirical results obtained. What is found here, is a possible alternative to traditional ways of achieving social change which whatever the ostensive and often idealistic aims,

may, by their mode of implementation maintain the established given and at worst add momentum to the extension and preservation of bureaucratic or authoritarian social orders.

An extension of a matrix structure to the next higher level becomes possible if we have a set of organizations each with a specialist task but with some overlapping competence which can link in smaller and shifting subsets in carrying out their tasks. It would appear that within a matrix organization, autonomous type groups will have a more appropriate context, given that they are able at this stage to take an active participant role within a larger organizational context.

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