Participative Design: Work and Community Life. 1974

Fred and Merrelyn Emery
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This paper has been revised five times since the original 1973 draft. As we have continued working with more diverse organizations and communities, so our knowledge of these genotypical design principles and how to use them and their power has increased. It is important to remember that while the design principles and the Participative Design Workshop (PDW) are most frequently used with workplaces, they are applicable to all organizations.

The workshop content – The genotypical organizational design principles

Since the Type III social environment came into being with the industrial revolution around 1790, we have been designing organizations on the basis of two dimensions only, the economic and technical or technological. The Type III environment was characterized by competition and the organizational form, the bureaucratic structure, that came with it also encourages if not engenders competition. We have been creating and maintaining these structures and the systems of management associated with them even since although the type of environment has changed and it has been proven since 1951 (Trist & Bamforth) that they are second best at meeting organizational goals.

Bureaucratic structures are also unable to systematically provide for the learning and personal growth and development of their members, particularly the large numbers at the base of the pyramid. They may be downgraded and de-skilled by their work experiences (e.g., assembly line and call centre workers). The bureaucratic conception of management's task has been inhibitive of learning and growth. Bureaucratic structures are now also implicated in the current epidemic of mental illness (deGuerre et al, 2008).

As people have become increasingly dissatisfied with organizational failures to meet their needs they behave exactly as McGregor saw in 1970 - with indolence, passivity, resistance to change, lack of responsibility, willingness to follow the demagogue and unreasonable demands for economic benefits. Years of increasingly desperate managerial fads and fashions to overcome these problems have failed and some of them have actually exacerbated the problems (deGuerre herein). Representative remedies such as joint councils and workers directors have also failed (Emery & Thorsrud, 1969).

The six psychological requirements

Because the third, *human*, dimension is missing from the design of bureaucratic structures, it is necessary to redesign it back in and thereby solve the problems. Cumulative investigations in Europe, Scandinavia, Australia, North America and India in the early days enabled social scientists to identify a number of important determinants of the psychological requirements of productive activity, located both in the dynamics of person-task relations and in the social climate of the organization (Emery & Thorsrud, 1969).

The human dimension has a hard core of six such requirements called ‘the 6 criteria’. They are the intrinsic motivators. They have now been shown to work in every country and culture in which they have been used so they could be called a species wide characteristic.

It is clear that particularly the first three of these requirements which refer to the content of the work or activity need to be optimal for any given individual and flexible to meet variations in individual need; e.g., from day to day, or morning to afternoon.

1. *Adequate elbow room*, also sometimes called autonomy. The sense that they are their own bosses and that except in exceptional circumstances they do not have some boss breathing down their necks. Not too much elbow room that they just don't know what to do next.

2. *Continuous Learning*. We accept that such learning is possible only when people are able to

- set goals that are reasonable challenges for them and
- get accurate feedback of results in time for them to correct their behaviour.

3. *An optimal level of variety*; i.e. they can vary the work so as to avoid boredom and fatigue and so as to gain the best advantages from settling into a satisfying rhythm of work.

4. *Mutual support and respect*, i.e. the conditions where people get help and respect from their work mates without asking and vice versa. Avoiding conditions where it is in no one's interest to lift a finger to help another: where people are pitted against each other so that `one person's gain is another's loss': where the group interest denies the individual's capabilities or inabilities (as in the bull gang system that used to characterize Australian dock work and New Zealand's meat freezing works).

5. *Meaningfulness*, a sense of one's own work meaningfully contributing to social welfare. That is, not something that could as well be done by a trained monkey or an industrial robot machine or something that the society could probably be better served by not having it done or at least not having it done so shoddily. Meaningfulness includes

- both the worth and quality of a product or service, and
- having a perception of the whole product.

Many jobs which are meaningful in the first sense have been downgraded because individuals see only such a small part of the final product that its meaning is denied them.

6. *A desirable future*. Put simply, not a dead-end job; but hopefully one with a career path which will continue to allow personal growth and an increase in skills and knowledge.

Experience has shown that these psychological requirements *cannot* be better met by simply fiddling with individual job specifications; e.g., job enlargement, rest pauses, better communication or supervisory contacts (see `The Light on the Hill' herein). If

the nature of the work allows room for improvement, this will be best achieved by locating responsibility, for *control* over effort and quality of personal work and for *coordination*, with the people who are actually doing the work, learning or planning.

The design principles

The reasons for the proven superiority of the group solution have emerged, rather painfully, over the past forty- five years of laboratory and field experiments (Emery F, 1973). The key differences lie in the structural relations of people, tasks and supervisor as seen in Figures 1 and 2.

These figures illustrate the organizational building blocks which result from design principles 1 and 2 respectively (DP1 and DP2). The basic module of a DP1 structure is a collection of people with a supervisor. The basic module of a DP2 structure is a self managing group. As described below, there are several variations on self managing groups.

For organizations to behave flexibly and adaptively, they must contain a degree of redundancy. There are two ways that redundancy can be built in:

1. by adding redundant parts to the system; each part is replaceable; as and when one part fails another takes over;
2. by adding redundant functions to the parts; at any one time some of the functions of any part will be redundant to the role it is playing at the time; as and when a part fails in the function it is performing, other parts can assume the function; so long as a part retains any of its functional capabilities (i.e. functional relative to system requirements), it is of some value to the system. (Emery F, 1977, p.92)

The people are the parts so redundancy of parts means there are more people than are required to do the work at any point in time. Redundancy of functions means that there are more skills and knowledge built into each person than the person can use at any one point in time.

DP1: *Redundancy of Parts*

Yield basic structural module of:

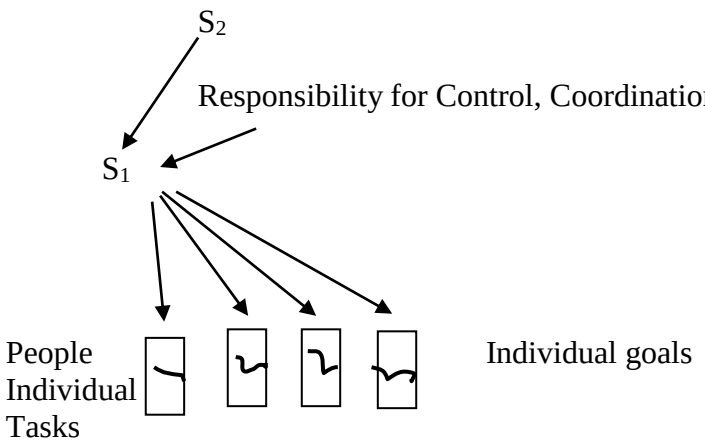


Figure 2. The Genotypical Organizational Design Principles

The first way gives us a DP1 structure in which responsibility for co-ordination and control is located one level above where the work is being done. The second gives us a DP2 structure in which responsibility for co-ordination and control is located with the people who are doing the work, the self-managing group.

Because they are taking responsibility for their own work and behaviour, a DP2 organization is called democratic, in contrast to the DP1 autocratic or bureaucratic organization which is the operationalization of the master-servant relation.

In other words in DP1, those above have the right and responsibility to tell those below what to do and how to do it. It is a structure of personal dominance, a dominant hierarchy. In large DP2 structures, there may be a hierarchy but it is a hierarchy of functions. In large DP2 structures, the functional levels may consist e.g. of the three levels of strategic management of the organization as a whole, resourcing and operations. Each level consists of one or more self managing groups but there is no right of dominance. Change can be initiated by any part of the organization as external and internal conditions change and all change is negotiated by peers.

Figure 1 precisely defines what has become the dominant form of organization that is still enthusiastically installed by production engineers and 0 & M experts alike. It was called ‘scientific management’. Control and co-ordination, the two dimensions of organization, are vested in the supervisor. S/he controls the subordinates by specifying what the individuals A, B, C, etc. will do vis-a-vis the task allotted to them, X, Y, Z, etc. Co-ordination is the supervisor's preserve. Achievement of the section's task will almost certainly be related to the adequacy of co-ordination because of either interdependence between the tasks themselves as found in process industries or variations in optional work loads between individuals.

Co-ordination is the variable the supervisor can manipulate and hence manipulate the image his or her supervisor has of them. This is not without its difficulties. Tight job specifications to give supervisors greater control on subordinates can also be used by them, particularly if they are unionized, to cramp the supervisor's style when s/he seeks to use idle time to help out on other jobs. In DP1 structures, employees almost universally develop an informal system or shadow organization to turn the requirements of co-ordination to their advantage; e.g.;
1. `Dargs' and other restrictive but informal production norms to reduce the productive potential with which the supervisor might do some shuffling;
2. Cliques whereby subgroups in the section make life easier by collaring for themselves the productive potential in co-ordination.

Because the purposes of these cliques are personal, designed to improve such factors as mutual support and respect, they tend to organize themselves around bases for common trust; e.g., religion, ethnicity, old school. They are not there to meet organizational goals so they do not organize themselves around the interdependencies of task and personal work capabilities that affect the section's productive capability.

The building brick for this type of organization is the one person-shift unit. Controls might be sloppy or tight but the principle is the same. The organizational module is

the supervisor and his or her section; with responsibility for co-ordination being jealously defended as the prerogative of the supervisor. The module and its basic building brick can be indefinitely repeated upwards to the managing director or CEO and the directly reporting functional managers. It is the organizational form that put up the pyramids and China's Great Wall. Understanding how the design principles work in practice shows why all the phenotypical changes advocated by the many fads and fashions in change management have no chance of changing things in the long term. Such manipulations leave DP1 in place and hence the power structure and communication pattern remain unchanged.

A brief analysis of Figure 1shows why it is difficult to get good levels of the 6 criteria in a DP1 structure. It is easy to see that this structure produces competition and once people are in competition, they must look after their own interests in order to survive. Over time, following self interest becomes a way of life in DP1 structures.

Elbow room. If S1 is doing their job properly, and particularly if there is a manual of SOPs, there are virtually no decisions for any of A, B, C or D to make.
Setting own goals and challenges. Goals are typically set by S1 who will set them according to the needs of the task. Typically also supervisors underestimate the skills and knowledge of subordinates, thereby further reducing the chance of a challenge to enhance the learning of A, B, C or D.
Feedback. It is notoriously difficult to get accurate and timely feedback in DP1 structures, even in organizations that have spent millions of dollars on the problem. That is because the structure militates against it. DP1 structures engender competition. At the most trivial level, there are 4 people competing for S1's job. If B is making a mistake, it is not in the interests of the others to tell B because by allowing B to continue to make the mistake, they are looking relatively better.
Variety. One person-one job is by definition not variety increasing. It is a recipe for deskilling.
Mutual support and respect. Competition seriously affects this criterion as well. If C has a drug, alcohol or mental health problem, C will typically be isolated as there are concerns about 'guilt by association'. Whistle blowers, target busters or anybody who risks what is perceived to be the road to individual advancement is treated badly. In competitive circumstances, comparisons are increasingly made and those with perhaps less intellectual prowess are not treated with respect for their efforts but laughed at or looked down on.
Social value. As the value placed on an activity is largely a matter of the broader societal or community value system, this criterion is less affected than others but within the hierarchy of activities in a section or organization, there will be less respect and/or concern for those with the least valued jobs.
Seeing whole product/service. Obviously where there are high interdependencies, a person on one spot on the process line has no chance of seeing the whole product as it emerges many, many jobs away. Similarly, in many professional organizations like consultancy firms, consultants are brought in to use a particular expertise and leave again without ever knowing whether the problem was solved or the organization became more efficient.
Desirable future. No matter how many skills a person may bring to a position, both new learning and skills maintenance are limited by the scope of that job. All other skills and knowledge are degraded over time. Additional skills and knowledge

training is frequently wasted by lack of opportunities to practice. Attempts to practice by assuming parts of another person's job can be severely resisted.

Communication problems like personality conflicts are typically blamed on the people but competitive structures distort both the quality and quantity of communication and accentuate personality differences. If A, confronted with new circumstances, believes that they need some help from B, the communication is still up to the supervisor and, as s/he sees fit, down to the subordinates. The communication which is needed to reflect and cope with changing task requirements is being channelled through a filter/amplifier system that is labelled on one side `us' and the other side `them'. The goals of the supervisor are those that concern the section's overall performance and explicitly no business of his or her subordinates, A, B and C. The subordinates' goals concern the performance standards set for sub-tasks X, Y, Z, etc. This means that communications are going to be amplified and attenuated in the same task related channel, by different criteria. The `us's' will amplify what makes them look good vis-a-vis their own task performance or relative to their `colleagues'. They will hear as little of the downward communication as suits them and they can get away with. The supervisor will be anxious to hear and remember what will sound good to his or her supervisor, including excuses for malperformance.

Communication can be a major weapon at any level of the hierarchy including the top. The easiest way to keep somebody powerless is to deny them accurate information or feed them misinformation. Gang warfare can break out at any level and can be pursued both vertically and horizontally.

DP2 *Redundancy of Functions*

Yield basic structural module of:

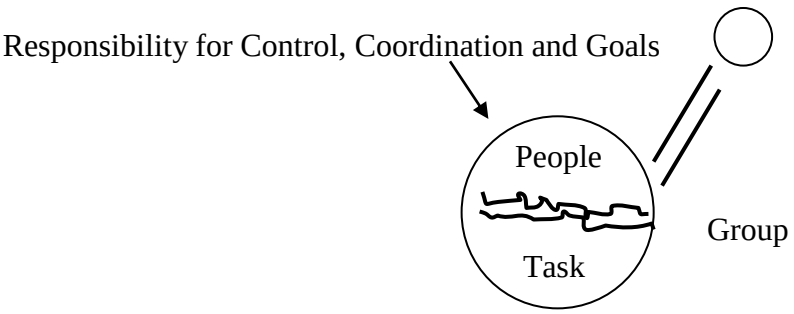


Figure 2. The Genotypical Organizational Design Principles

The *democratic organizational module* (Figure 2) has markedly different potentials. The first and obvious feature is that there are no individual jobs or positions. A, B, C and D are now jointly responsible for all the tasks and all the interdependencies (interactions XY, XZ, YZ, XYZ...). They are also responsible for monitoring and controlling the contributions of its own members, organizing themselves to cope with individual and task variations and meeting their set of agreed goals.

DP2 structures engender cooperation and affect the 6 criteria and communication in ways that are starkly different from DP1.
Elbow room. The group now has many decisions to make but if D does not like making many decisions, they can leave them to those who do like it.
Setting own goals and challenges. Within the set of group goals, are many subgoals and in the process of working out who will do which task and when, individuals have plenty of room to build in challenges for their own learning.
Feedback. Because it is the group as a whole that is held responsible for meeting its goals, it is now in the in the interests of them all to ensure B fixes the mistake. If the mistake continues and the goals are not met, it is the group that carries the blame not any individual.
Variety. People who thrive on variety have it available while people who prefer less can stick to one task for longer.
Mutual support and respect. There are examples in the literature and folk lore of people with intellectual disabilities who grew remarkably after becoming a member of a self managing group. DP2 structures provide the individual with a human scale of organization (a work `home', `family' or territory) whereby people feel they fit into the organization, no matter how large that may be. If C has a drug, alcohol or mental health problem, C will be the subject of much group concern and care. The only danger here is that groups may persevere with C past the point where C should be referred to professional help. That is, however, a rare case as most people recognize the limits of their expertise.
Social value. People in DP2 structures actively work to increase and promote the value of their activities and its outcomes. Remember change can be initiated from any point so those working directly with customers or clients can often see ways of increasing social value and take it to the whole.
Seeing whole product/service. One of the criteria of a good DP2 design is that a group has a whole task, from beginning to end, and one of the characteristics of a DP2 organization is a high level of knowledge of the organization as a whole so that if the group's end product is still simply a component, individuals still understand the meaning of their contribution.
Desirable future. The ambitious now have the full range of skills and knowledge available in the group task to learn and work can be organized so that individuals keep their skills up through practice. When a person has learnt all there is to be leant in a group task, there are a variety of mechanisms such as rotation, swaps, minor redesigns etc available so learning can be continuous.

Communication and power within these groups take on markedly different characteristics to what we find in DP1 structures. There is no 'them' and 'us' in DP2 as 'we' are all in it together. (Emery & Emery, 1976). This is why communication and power cannot be taken as basic variables of organizational design. They are universally present attributes of organization, but they do not tell us much of relevance about what is communicated, what is commanded.

Changes in organizational design affect the nature of communication but the reverse does not hold. Provided we have a group and not just a collection of individuals or a mob, and that the group has accepted responsibility for a group task, then it will seek to make its life easier (or more productive for their ends) by: (a) communicating quickly, directly and openly the needs for co-ordination arising from task or individual variability; (b) by allocating tasks and other rewards and punishments to

control what they consider to be a fair contribution by members. Such groups can get a sense of an over riding group responsibility only if they have at least four members. Four is the minimum number for stability as two can become very close as in an old married couple and with three it is too often shifting coalitions of two against one. However, in today's world, there is rarely a circumstance where any two people can work together without significant contact with others so the concern is far less.

There is no definite upper size of groups as larger groups can be very effective if they share a deep rooted culture and the parts of the group task are highly interdependent (e.g., the eighteen man Australian Rules team of footballers). However, group size is usually a function of task plus technology and people know what size is appropriate in their circumstances with their skills and knowledge.

These groups are self managing, not autonomous as they often were in cottage industry. They are working with materials and equipment for which the organization is responsible for getting an adequate return. They are working in conditions where the organization, not they, is responsible for observing the mass of social legislation laid down for basic pay rates, safety, product quality, etc. Groups themselves are also interdependent as their collective work adds up to the work of the organization as a whole.

People cannot be expected to accept responsibility as a group unless a number of conditions are met. The psychological requirements that individual workers have of their jobs are just about equally relevant for a face-to-face group of workers. They must know that they can aim at targets that are explicit, realistic and challenging to them; and they must have a feedback of group performance. That is why they are given the first go at setting the group goals and deciding on such matters as mechanisms for coordination. They know best what they can accomplish and how best to do it. They will set up systems for monitoring their own goals so that they are met and will ask for further learning or training when the task requires it. Work in a DP2 structure is dynamic and constant change should be expected.

In setting and agreeing targets, care must be taken to avoid lopsided simple minded targets that might encourage shoddy workmanship, unsafe practices or a `bullgang' atmosphere where group members come under pressure to go for target levels that are only really suitable for the young, the strong and the greedy. The group must set a comprehensive set of goals, including human, social and environmental as well as the purely economic and technical. Every aspect of the work must have a goal attached. It is the people who are actually doing the work who know best what goals are possible but these must be negotiated and agreed with the current management before going into practice. Typically management has underestimated goals.

They must feel that the membership of their group is to some degree under their control and this can be handled by having a group member sit on selection groups for example. They must also be able to negotiate people out of groups if need be. The roles of spokespeople or temporary leadership and training usually move around the group as circumstances and needs change. These arise from daily group working. For example, in emergencies, they will call on the person who has most knowledge of the situation being experienced. There are no stable definite roles.

Multiskilling does not mean that everybody must be able to do everything. It simply needs to be sufficient to allow flexible allocation of work within the group and to encourage the cohesiveness of the group. How they allocate the work is their responsibility and so is on-the-job training which the group will have considered in its initial analysis of the skills it holds as a group.

It will be noted that these steps toward setting up self managing work groups requires more explication of goals, methods and responsibilities than is usual. The common sense and good judgement of a supervisor is no longer enough. If these things are not worked out there is a danger of drifting into a laissez-faire atmosphere. Groups agree amongst themselves on mechanisms for decision making for co-ordination and control.

Alternatives to full multiskilled self managing groups

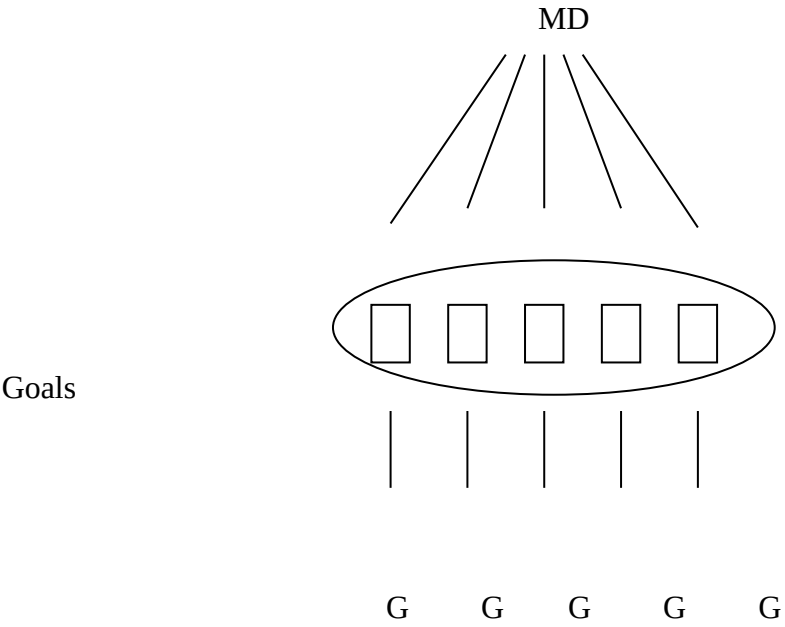
There are two major alternatives to the full multiskilled model in Figure 1. The first covers circumstances where for whatever reason, specialist skill or knowledge level or legal demarcations, sharing work is not possible. The second applies to non-stable work, i.e. work that comes in as discrete projects or batches where the specifications vary on each occasion.

In research labs there may be highly skilled statisticians, biochemists and glass blowers. Each has a special contribution to make and while overall success depends on the effective co-ordination of their activities, one cannot expect to achieve this by each person becoming expert in all of the required disciplines. In the management of enterprises we sometimes confront the same dilemma.

Beneath the managing director are functional managers for production, finance, marketing, personnel and administration, R & D etc. They are typically chosen for their expertise and it is not expected that the production manager will be as good at financial matters as the finance manager. They in turn expect to be judged and rewarded for their expertise in their function.

Concern about the frequent maladaptive behaviour in management ranks has been manifested in the rash of efforts at `matrix' organizations for R & D work and `team building' for management. A lot of these efforts have been described as creating pockets within persisting bureaucratic structures where this is an `open culture', `trust' and `understanding'. Sounds good but a recent analysis of such a change confirms that these approaches create laissez-faire (Emery & Aughton, 2006).

A more prosaic but effective solution is to change to DP2, *locating responsibility for co-ordination clearly and firmly with those whose efforts require co-ordination if the common objectives are to be achieved*. While control, the vertical dimension, cannot be shared, there is no reason why they cannot accept group coordination.



In this variation of DP2, control and coordination are split with control remaining with the individual while there is still shared responsibility for coordination and goals. It is applicable for transdisciplinary research and some project teams etc.

Figure 3. DP2 for Non-multiskilled activity

Figure 3 shows the structure we propose using the management example:

In DP1, the functional managers will be jockeying for influence with the MD so that s/he comes down in favour of their functional policies. This does not exclude temporary informal alliances between some functional managers to better ward off the threats of others. All rather suggestive of palace politics.

In this variation of DP2, the functional manager is judged and rewarded, or punished, as much for his or her effective coordination as for the ability to propose and implement policies in their division of the organization. If an unresolved conflict arises between the managers, the MD must sort out whether it is because one or more of them is incapable or unwilling to find a suitable compromise or whether the framework of policy that s/he is responsible for creating is inadequate.

In the first case the MD must decide on some re-education or redeployment; in the second, s/he must move from the normal operating mode, where they are relatively free from ongoing intraorganizational commitments, into a policy forming mode. The MD and managers need remain in the `policy mode' only long enough to create an adequate framework of operating policies (I have been inclined in the past to write off the style adopted in the `policy mode' as rather irrelevant; MDs form a very small proportion of the work force! This now seems an unfair reflection of my experience. Admittedly, a relevant and acceptable body of overall policy must come into being, no matter how. However, MDs who deny their managers' involvement in formulating the

principles they must use to coordinate their efforts must be dangerously conceited or charismatic (Emery F, 1974). Respecifying job responsibilities in line with Figure 3B is a simple matter.

This modified design makes it easier to identify a potential leader. When a person is paid for putting their best effort only into their speciality (DP1), there are questions – e.g. is the best specialist the one best fitted to ensure the overall objective? In a genuine team structure (3B) it is relatively easier to see who is best capable of grasping the overall structure within which they better make their specialist contribution. It may be, for example, the production manager who recognizes that s/he must accept a suboptimal solution to the length of the production runs if marketing requires a greater range of products; to accept a suboptimal level of stocks with all the difficulties it makes for managing production if the company needs a higher level of liquidity. It is the ability to work in this way that would indicate a potential for overall leadership.

One Level organization

Whole organization is decision making
Body composed of temporary overlapping project teams

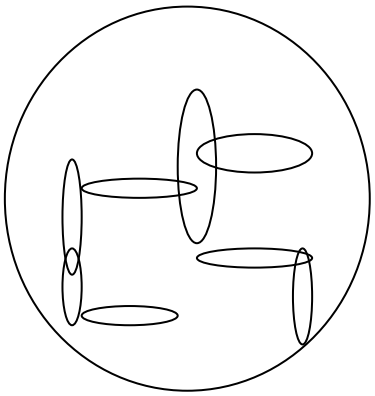


Figure 4. DP2 for unstable activities

The design in Figure 4 shows a small organization which consists of overlapping project teams. An example is the USA Forest Service where each forest contains a range of specialists in silviculture, fire management, archaeology, zoology etc. The only stable work is clerical and handled by a small self managing group. Projects come in from anywhere from Washington to the local community and may take from a few hours to years to complete. Staff may be working on a variety of projects at any point in time with different percentages of their effort allocated to very different project types.

When a new project comes in, all those available to make the decision as to how to staff it, meet and allocate the work. In this small very dynamic form of DP2, everybody knows who is doing what with which skills and knowledge. The whole is, therefore, the decision making body while project teams makes the decisions about completing the project once it has started.

In a large organization all of these various types of DP2 can be mixed and matched without problem.

Reasons for the Participative Design Workshop (PDW)

The strategy and its underlying assumption described here depart radically from those employed in the UK and Norway. The reasons for these basic changes are simple.

The experimental phase for changing organizational structures from DP1 to 2 finished with the success of the Norwegian Industrial Democracy project (Emery and Thorsrud, 1975). All that remained was diffusion.

Diffusion is an educational process and the most effective learning comes from an experience of integrated theory and practice. Organizational members have by far the most detailed knowledge of their sections of the organization and require only the concepts and tools of organizational design in order to redesign them.

At the beginning of the diffusion phase in the early seventies there was learning to be done, but it was learning about how to most effectively design the settings within which people could learn to redesign their own organizations. Those learnings accumulated over many years are described here.

The role played by social scientists in PD workshops today is much more congruent with the philosophy and ideals of democracy than was the earlier role (in the method now called STS – see contrasted herein). This is brought out most clearly by the ways in which analysis is handled, the involvement of relevant workers in the process itself and the resource role of an external agent. The learning environment created in these workshops is therefore itself a working example of DP2 structure.

It is absolutely critical for the continued good functioning and adaptiveness of a group that they have conceptual knowledge of the design principles and what is involved in self management. With this they can deliberately evolve their design towards greater group responsibility and effectiveness. Without it, the design can evolve over time, regressing towards DP1. Simply setting up groups and calling them self managing without their appreciation of what is entailed in responsibility for co-ordination and control, and without an opportunity to agree as a group on the `how', can induce frustration and short-lived cohesion.

Also, if groups of people are to be expected to take responsibility for self management, it is important that they have designed their own section of the organization. For many years, particularly in Norway, we felt that this involvement needed only their right to choice in matters of detail, a genuine democratic vote by them whether to go into the new scheme of working and real guarantees about their right to opt out, individually and collectively. We have learnt that this creates an unhealthy reliance on outside experts and hinders the emergence of a self sustaining learning process in the groups.

The assumption underlying the method described here is that the most adequate and effective designs come from those whose jobs are under review. It is only from people pooling their various and usually fragmented, but always detailed, knowledge that a comprehensive and stable design can come. More than that, it is only when the people involved work out their own designs that the necessary motivation, responsibility and commitment to effective implementation is present. The difficulties which are almost

inevitably met in the initial phases of implementation may be found to be overwhelming if designs are imposed from above or by external agencies such as social scientists. The people must '*own'* their section of the organization.

PDWs are preceded by a comprehensive preparation but final briefings on the concepts are included again. The aims of the design are spelt out to the participants as in the above statement of psychological requirements and they then proceed to: (a) analyze what the organization is now doing to its people and their skills; (b) assess how far this falls short of meeting the human requirements; (c) redesign for DP2; and (d) work out all the additional practicalities that will ensure the design will work well in practice and when the new design will be implemented. Within the process of participative design there are problems and questions common to all technologies. Only the most common and fundamental of these are included here. Although the PD workshops themselves are often not the appropriate time for resolution of some issues which arise from structurally innovative designs, an awareness of negotiation and action is developed.

As will become obvious from the following discussions the philosophy of participation as spelt out in practical detail is considered appropriate not only to industrial and white collar/clerical work sites but also to communities and educational institutions (Williams, 1975). ***All*** organizations explicitly or implicitly are built on one of the design principles.

Design of the workshop

Analysis:

- Briefing 1. 6 criteria, DP1 and its consequences
- Groups fill in matrices for 6 criteria and skills held

Change:

- Briefing 2. DP2 and its consequences
- Groups draw up the workflow and formal legal structure and redesign the structure

Practicalities:

- Briefing 3: for additional design tasks
- Groups do the additional tasks

The day begins with general introductions and a run through of the plan, explaining the purpose and process of each part. This is essential even when teams have had prebriefings. It provides a unity of context for the time and because it stays up on the wall everyone can see how the work is progressing relative to time constraints.

The first briefing deals with explanations of design principle 1 as above, its inverse relation to the 6 psychological requirements of an organization and to skills. It concludes with detailed instructions for creating and completing the two matrices.

Presentation of this content appears to be most effective when it is simple, brief and visual. It is infrequent that clarification of basic concepts is requested. They seem to be readily grasped, regardless of the educational level of the participants.

All group work is reported but the managers report on the matrices for 6 criteria and skills held so that participants can learn to use these as diagnostic tools. The results are taken into account in later phases.

Table 1.Matrix for the 6 Criteria

Psychological Criteria	**Mary**	**Jim**	**John**	**Alice**	**Joe**
1. Elbow room for decision making	-2	0	-1	-3	-2
2. Learning:					
(a) setting goals	-4	3	-2	-3	-3
(b) getting feedback	-3	-4	0	-4	-4
3. Variety	-3	5	0	4	-3
4. Mutual Support and Respect	8	4	2	8	8
5. Meaningfulness:					
(a) socially useful	9	9	9	9	9
(b) seeing whole product	4	10	7	3	4
6. Desirable Future	3	7	6	2	2

Because the first three criteria need to be optimal for each individual, these three are scored from -5 (too little) to +5 (too much), with 0 being optimal, just right. As the second three criteria are things you can never have too much of, they are scored from 0 (none) to 10 (lots). The final group product will express the relativities of scores across the section.

The pattern in this matrix is fairly typical. Sections organized on design principle 1 typically show a majority of low scores on the first three criteria. Scores on the second three are more unpredictable. From the above pattern, if you didn't know at the time, you could deduce that Jim was the supervisor, very happy with his autonomy, but having to look after too many things at once (variety and setting goals). Because he is an S1, nobody gives him much feedback and he doesn't see himself respected or supported. He does, however, have a fairly desirable future.

You could also deduce that John is probably Jim's offsider (or favourite) and suffers for this by low levels of support and respect. As Jim may be grooming him to take over, he sees he has a fairly desirable future. Mary and Joe both have single or simple functional jobs. Alice comes across as a general dog's body for the section. All three are aware that they have little by way of career path or improving chances on the job market. Mary, Joe and Alice stick together and look after each other. All recognize that the work of the section is socially useful, but only Jim and John are in a position to really see how their bit contributes to the whole.

This is only an example of what can be deduced from such a matrix. In a real workshop, much of this is already known by participants and the diagnostic use in the report session confines itself to noting the major problem areas for rectification in the redesign.

The other advantages of this first analysis are,

- firstly, that any misconceptions of the criteria are hammered out by the group and a common and well founded understanding is established; and
- secondly, this first task is usually sufficient for members of the team to become acquainted with each other if they have not worked together closely on site, and to become a group.

This is necessary because of the fragmentation that has taken place, but a cohesive group is formed fairly fast under these circumstances.

The second task for the groups is to draw up and fill in a matrix of skills and knowledge currently held. Firstly, they must list the essential skills required in the section to make it work. Then, using a simple scale of 0 for none of a particular skill, and one tick for a sufficient level of skill to back up and two ticks for a high level of skill, the groups compile a collective picture.

Table 2. Matrix for Skills Currently Held

Essential Skills	**Mary**	**Jim**	**John**	**Alice**	**Joe**
A	xx	x	0	0	0
B	x	x	x	x	xx
C	0	xx	xx	0	x
D	x	xx	xx	0	0
E	x	xx	x	0	x

F etc.

It is clear from Table 2 that only on skills C and D is the section covered for a high level of skill in cases of an emergency. If Mary is sick, only Jim can cover for skill A at a lower level of skill, and Jim already has too much to do. The group can probably muddle through in the short term on skills B and E. The basic rule for a multiskilled section is that there must be at least two people with a high level of a particular skill with a backup or two.

In the discussion of this report, the group would mark skills A, B and E as requiring further training. In the final session they would return to this analysis and from it spell out who should receive what training for which skills and whether it can be done on the job or not, the time involved, etc.

In the example above, it is easy to see why Mary, Joe and Alice rate their desirable futures low. Mary and Joe are stuck with basically single functions and Alice has few skills at all, and little opportunity to learn. With the change to a design principle 2 structure the section has the chance of moving to career paths based on payment for skills held. Using the same skills matrix, sections have a first go at designing a career path of skills. Such a career path is democratic because movement through it is

determined by the motivation of the individual rather than by the imposed structure of the organization.

The second briefing deals with design principle 2 and its relations to the 6 criteria and skills. This briefing deals with the multiskilled and alternative models and possible overall organizational designs. It ends with instructions for drawing up the workflow and structure and for redesigning the latter.

Groups begin on this phase allowing sufficient time for them to consider options for redesign. An interim plenary can be useful as groups learn from each others' efforts and compare notes on options. When a group has a final design that the managers consider workable, the third briefing is given.

The third briefing outlines a further series of tasks which will help the groups ensure that their designs will work. It includes instructions for spelling out:

- a comprehensive and measurable set of goals and targets for the section;
- their requirements for essential training before start up of the new design
- what else is required such as layout changes, equipment, mechanisms for internal co-ordination and external relations;
- a career path based on payment for proven skills/knowledge held and broadbanded and
- an explanation of how their design will improve the scores on their matrix for the 6 criteria.

It is essential that goal setting is done with thought and care. It is this set of goals that controls the work of the groups and must, therefore, be realistic as well as challenging. The task goals set finally agreed by management and the groups are compounded of both task (quantity and quality) and human components. Where the goals set are only targets of quantity, the opportunity is opened of subversion of the group into a `gang'. The incomplete nature of the goal leads directly to inter-group competition, neglect of interdependence, i.e., of group tasks and abuse of individual members - their needs and unique contributions.

What is required is a comprehensive and measurable set of goals, including occupational health and safety, environmental and social responsibility and individual psychological and economic (career path) goals. These should fit within the organization's strategic plan - if not, there must be an adaptive adjustment to either the sections' goals or those of the organization.

No group will probably have all the skills or knowledge required for the final career path but each of the little group parts will be given to a career path designer who welds them into a comprehensive path that will be relevant to all members.

It is essential to complete the first three tasks in the workshop and desirable that everybody a feeling for the remaining tasks which can be finalized back home. As much should be completed in the workshops as possible, for learning as well as efficiency.

Final reports are given and relevant management should be present to hear these, particularly if groups give, e.g., notice of significant needs, changes to existing goals and targets or ideas about layouts, technologies, merging of existing sections.

Preparation and planning

Like any other venture, democratization will be only as successful as the quality of its planning. Obviously, nobody is going to embark on PD workshops for a serious effort at democratization until:

- the enterprise has made the decision to change the design principle; and
- if the enterprise is unionized, there is at least a draft agreement in place specifying the terms of the change. This agreement needs to have as its core a clause relocating responsibility for co-ordination and control at the level where work is being done, i.e. DP2. Do ***NOT*** rely on alternative words here. Terms such as 'self managing teams' have been totally corrupted and are, therefore, open to abuse. The wording has to absolutely precise so that any part of the org chart can be checked against the EBA.

Selection of persons to be involved in design

Generally, the most important criteria are the selection and size of the group doing the design. Given a small discrete or well defined section or unit, say 4-15 persons, it is best that where possible, everybody in that unit work together on the design.

In large sections it is necessary to take at least one `deep slice' through the section where every level and as many skills and functions are present as possible. The `deep slice' was used as a strategic technique for the first time in Australia in 1971. It was tried as a response to a receptive and anti-expert oriented climate where the demand for visible and self generating change was strong.

In general, the rule is that the slice should mimic the ratio of the numbers in the levels in the section. Once the unit understands the form of the deep slice, they choose the individuals according to the criteria of size and ratio. For SAMCOR[1], the Yearling Hall selected as its deep slice two labourers, two slaughterers, the rover and the floater (first line supervisors for slaughterers and labourers respectively), the broadwalker (superintendent of the Yearling Hall), and the fitter. Present also for part of the time were the Secretary of the Meat Workers Union, the General Manager of SAMCOR and the Worker Director of the Board. One each of the labourers and slaughterers were union delegates on the floor.

Shifts have to be designed as separate units as obviously they have different people and usually different numbers and levels. It is not unusual in DP1 structures for graveyard shifts to self manage. It is obviously not a feasible alternative to have separate groups working on part solutions or aspects of a section design.

In large units or sections there are various ways of getting wide participation through workshops. Mixed teams from the same unit can work in parallel in the same workshop on an overall design which can be integrated, or different teams can do

[1] South Australian Meat Corporation

designs for the whole unit in different workshops which can be compared and integrated later on.

The basic rule of PDWs is that *no design can be imposed*. Even if circumstances dictate that only one vertical slice team can attend a workshop, they have a responsibility, and are instructed, to take home:

- most importantly, the concepts and process so that everybody completes the matrices, and
- secondarily, their draft design in order to genuinely, participatively produce a final design from the whole unit.

In large organizations with many levels of dominant hierarchy and diverse operations and products, it will be necessary to run PD workshops which have overlapping membership of the middle ranks. This increases the options for middle management as well as ensuring greater coherence of design and learning up and down the old hierarchy.

There is itself a design art in the ways in which PD workshops are put together.-.with parallel teams or with mirror groups, sorted with different organizational purposes in mind. These options are elaborated in `Further Learnings about Participative Design'.

Note on participation of unions, other management and loners

The industrial conditions today are radically different from what they were when the original PD paper was written. However, there is still the same need for ownership and understanding of the design principles and their implications by both union representatives and all levels of the organization. Unions must be involved from the very beginning and continue to be involved until a new stable DP2 organization is achieved.

It is assumed that the understanding of consequences by top management have been assured before the PDW. It is similarly assumed that management has a set of strategic goals or organizational guidelines which can be introduced to groups if they don’t know them. This understanding will be furthered if management can participate in the design process itself, at beginning and end.

Any remaining suspicions of union and operators will be further alleviated if management in person can at the time of the workshops reiterate either by word or deed its encouragement of the process. Top management need not be present throughout the process, except perhaps as observer, but they should be encouraged to come in at the beginning to state organizational purposes. Management will better appreciate the organizational implications concerning, for example, training requirements and possible costs thereof if they are present at the end to hear the team present their design, goals and other practicalities. Remember, they will be involved in their own PD workshop.

Loners can usually be accommodated by groups by designing around them. This does not present difficulties unless the ‘loner’ is in a position whereby opting out, s/he is denying others the opportunity to learn new skills/knowledge or experience much better working conditions, e.g. the air conditioned office. In these cases, the loner

must be denied. The special case of the loner who has difficulty in adapting to democratic ways after years of entrenched status differentiations often needs the consultation of the group and management.

The workshop manager(s). In these workshops it is not necessary that the outsiders are experts in the field of work that is being designed. Their job is to help the assembled workers and management pool their knowledge and use their expertise, wisdom and brains. They are the managers of the learning process and environment. This does entail enough familiarity with the work in question to follow the discussions and sense when bottle-necks are emerging, red herrings being pursued or when pseudo obstacles or conflicts are being generated (it is remarkable to find in any workplace how many things are technically impossible, things that have been done in `the place next door' for years). But this role is a long way from that of the expert who presents the best solutions. When mirror groups are built into the workshop, they perform the questioning role.

An outsider is required for PDWs as an insider will inevitably get caught up in organizational politics. PDW managers are *process managers, external resources* and are very much *hands on the content*. As an external resource they can help broaden the workshop's range of experience and deepen their analysis with social scientific concepts. They are experts in organizational design and have a responsibility to make sure that all designs will work in practice.

As well as ensuring the formation of a work group, the behaviour of the manager has indirect learning for the group. Whether or not this is made explicit, the members of the design team now have at least one experience of being a self managing group which has successfully worked towards its task goal. It is useful to point this out to members who become resistant to the idea of groups functioning without constant supervision.

Educational PDWs

Participative design workshop can also be used, however, as an educational medium for organizations which want to learn what democratization means and entails. In this case, it is important that everybody involved is open and explicit about its nature and limitations. It is vitally important in this case that members of a natural section agree to participate, knowing that there may be no follow-up.

In both the cases of serious democratization and simply learning about it, the selection of persons to do the redesigns is critical.

PDW for design

There is a modification of the PDW when an organization must be designed from scratch. This form is the appropriate one for Greenfield sites, research project teams that do not exists in an organizational context and for the design of organizations for implementation of action plans produced by a Search conference. This modified form is discussed in *Searching* (1999).

Summary

It should be restated that these are only a selection of the issues that arise in implementing change of design principle. The discussion given them is drawn from the experiences of those who have worked towards successful implementation, but the reader is reminded that `credulous imitation' is rarely a formula for success. The most effective designs are more likely to be achieved by those involved in their own unique variant of people, circumstances and technology.

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