

# **Theory, Method, and Process: Key Dynamics in Designing High-Performing Organizations from an Open Socio-Technical Systems Perspective**

Bernard J Mohr

# Theory, Method, and Process: Key Dynamics in Designing High-Performing Organizations from an Open Socio-Technical Systems Perspective

Bernard J Mohr

## High-performing systems: Characteristics and Requisite Conditions

Any organizational system is an intricate web of roles, management practices, structures, processes, tasks, technology, and people. How these elements interact with one another determines how successfully an organization can produce a service or product within the constraints of cost, quality, timeliness, safety, and customer requirements. Organizations that continually succeed within these constraints can be considered high-performing systems.<sup>1</sup>

One can measure or evaluate a high-performing system (HPS) from an individual level, a "people" level, a system level, or organizational level. Organizations seeking to become high-performing systems must design their work systems to ensure that the following three conditions are met.

1. **People must be able to do what is expected of them.** This means guaranteeing the availability of appropriate skills, resources, technology, and opportunities within the work system.
2. **People must want to do these tasks.** This implies a level of individual commitment that can only result from appropriate management

practices, reward systems, company norms and culture, and work designed to be intrinsically fulfilling.

3. **People must be allowed to do these tasks.** This requires management of responsibility and discretion, the elimination of unnecessary boundaries, and increased access to information needed for operations.

Every work system devises its own way of modifying roles, tasks, processes, and technology to create these conditions. What matters is that they exist, through whatever process. The conscious creation of these conditions - a process called organization design - is how the infrastructure for an HPS is developed.

In addition to knowing about these "people conditions," one should also learn the system- or organizational-level description of an HPS. According to this description, high-performing systems have the following characteristics.

1. **An HPS largely achieves both its human and business/service goals.** Contrary to some widespread ideas, an HPS is not a "perfect" system that achieves 100% of what it strives for. Rather, an HPS performs in the "top range" most of the time. It

*Bernard J. Mohr is a Principal with Innovation Partners International. His areas of expertise include corporate transformation, high performance/high engagement work systems and leadership for complex organizational change.*

may not meet every deadline, constraint, or individual need, but observers of high-performing systems describe them as consistently ranking in the “top ten” of their fields.

2. **An HPS can adapt to changing requirements with minimal disruption to goal achievement and minimal cost (economic or otherwise) to the organization’s members.** The pace and quantity of changes confronting organizations today are greater than ever before. They must address new demands from employees, customers, competitors, and regulatory agencies. The hallmark of an HPS is its having the flexibility to modify its operations in response to these demands – through ways other than going out of business. An HPS can adapt to change without incurring the economic, psychological, and emotional trauma often associated with major organizational transitions.
3. **An HPS is characterized by an alignment of the organization’s culture, vision, and structure.** OD consultants often find organizations that have worked hard to create their own visions. This refers to a widely shared image of an organization’s preferred future. A vision becomes the driving force for deciding what kinds of norms, values, and beliefs are to be inculcated. In modifying these cultural elements, organizations frequently find that the structure of work and authority are major factors influencing their cultures. Only when an organization’s vision, culture and structure are “in sync” can this organization exhibit some of the characteristics of a high-performing system.

For example, an organization in the forest products industry developed a vision of operating as a series of small entrepreneurial businesses (within the structure of the larger plant). To attain this vision, management found the need to make major structural changes affecting supervision, and to support this with changes in the incentive system so that business results would be valued more than individual performance. These changes enabled the organization to align its vision, culture, and structure.

4. **An HPS achieves its energy for operation from a high level of individual commitment, which is generated within individuals rather than imposed on them externally through mechanism of control and punishment.** The underlying premise is that although all organizations create various amounts of human energy, an HPS both requires and generates more of this. Human energy is needed for productivity, and high-performing systems consume unusually high levels in seeking to be constantly responsive and effective in attaining their goals despite changing environments and pressures to reduce costs (something faced by all organizations, from government to the automobile industry). An HPS can consume so much energy only ensuring that equivalent or larger amounts are constantly generated.

To evaluate the performance of an HPS, the following measurement criteria can be used.

1. **The ratio of resources consumed to the value of what is produced.** This is a basic criterion for evaluating all organizations. Unless the perceived value of an

organization's "output" – whether this is a social service, a physical product, information, or, as in the case of symphony orchestra, a pleasurable experience – exceeds the perceived value of the "input", the organization not only cannot be called a high-performing system, but it will soon cease to exist at all.

When examining this criterion, one must not limit one's definitions of input and output to traditional monetary ones. Rather, one should refer to a "give/get" ratio. This is the ratio of expected return on "gives" (EROG) to actual returns on "gives" (AROG), based on perceptions of stakeholders who provide the resources enabling the organization to operate. When the "gives" include such resources as labor, energy, commitment, electoral mandates, political support, information, physical materials, and money, the "gets" (i.e., return for one's investment) include enhanced power and status in addition to valued products and services, job satisfaction, and money.

2. **The timeliness and quality of the system's output.** No matter how excellent a symphony orchestra is, unless it produces its "product" at the times its customers want to "consume" it, it cannot be considered an HPS. Similarly, a company may offer a highly popular toy, but if it cannot make this available in stores until the week after Christmas, the company cannot be considered an HPS. With respect to quality, the American automobile industry offers classic examples of organization able to meet deadlines, but having more difficulty ensuring sufficient product quality to maintain their historical shares of the market. Although these

companies have put forth major efforts to improve this, they continue to suffer from a perceived "quality gap" in the minds of a significant number of potential customers.

3. **The appropriateness of the output for the primary receiving system.**

The primary receiving system consists of those individuals or groups an organization is primarily in the business of serving. A hospital's primary receiving system is its patients; an accounting firm's primary receiving system is its clients. The output of an HPS is typically considered desirable and relevant for its primary receiving system. Examples of organizations meeting this criterion include accounting firms that deliver advice on taxes when asked and bookkeeping services upon request. An accounting firm that fails to provide its clients with necessary financial planning advice, however – or provides advice its clients' consider useless – would not be considered a high-performing system.

4. The degree to which the internal individual commitment – rather than control – of organization members is the primary source of energy for operations. As discussed above in the section on system-level characteristics, the issue is the balance between control versus internal commitment (Walton, 1985) as strategies for generating human energy in an organization. All organizations require some degree of internal control as a mechanism of coordination and general management. High-performing systems tend to rely more on members' commitment to the work place as a way of achieving necessary behaviors rather than on

such controlling tactics as use of time cards, close supervision, piece-rate compensation, and the like.

These four major criteria, along with the description of system-level and “people” characteristics, form the framework for understanding high-performing systems and for evaluating the extent to which a system can be considered high-performing. The following section discusses how to create (i.e., design) such a system, whether one is modifying an existing organization or starting a new one.

### **Organization design, open sociotechnical systems, and high-performing systems**

This chapter previously referred to the organizational system as an intricate web of roles, management practices, structures, processes, tasks, technology, and people. Organization design is an umbrella term for the conscious creation of an HPS through the systematic and systemic modification of some or all of the above elements making up the “intricate web”.

A systematic approach is one based on a thoughtful consideration of change and the politics involved with this, and on a comprehensive diagnosis of what exists (this differs from an approach that simply adopts the latest management fad, such as management by walking around, quality circles, or the like). A systemic approach is one based on the recognition of the interconnections of these elements and the tendency of organizations to resist change unless a “critical mass” of the elements are modified to support the change. For example, attempts to modify people’s work responsibilities to make them more entrepreneurial are unrealistic unless simultaneous changes are made in incentives decision making, and information, and opportunities are provided to develop required skills.

The rest of this section examines in more details some of the major organizational elements typically analyzed and modified during an organizational design – or redesign – process. Individual skills invariably need development, for new work roles require behaviors different from those learned over the years in the organization. The types of skills needing development are skills related to team and interpersonal relations and technical skills.

In the case of the redesign of major railway organizations, the number of work role classifications was reduced from 16 to 8. Because of this, employees needed extensive retraining in technical skills. For example, person who had worked as porters needed to learn how to be waiters, make coffee, and the like. Moreover, the redesigned organization called for work teams to meet at the start of a trip so that members could assign tasks, determine food requirements, and so forth, creating a need to develop skills in problem solving and team decision making.

Organizational redesign affects the availability and allocation of physical and financial resources within the work system. Because the processes for distributing scarce resources can be designed in many ways – each having a dramatically different impact on system performance – the organizational design process requires careful assessment of alternatives. One frequently used option is to assign responsibility for supplies procurement to the work group actually responsible for using those supplies. This movement toward semi-autonomous work teams has systemic implications for the traditional staff functions of purchasing and finance. The organizational design process must also note how the roles associated with these functions will need to be modified.

Technology design is another part of the overall design process that can aid in achieving the desired level of total system performance. Technology can be designed so as to either minimize or maximize the operator's control, or to provide little or much data. For example, when Ford Motor Company sought to improve product quality, it gave each assembly-line operator access to a button that, if pressed, would shut down the line. This modification gave the operators more control over the technology, an important variable of the overall quality improvement program. Of course, such modifications make sense only if operators have timely access to data enabling them to take action appropriately. Technology can often be designed so that additional "readouts" of information become available to operators.

Modifying management practices is an essential component of organization design. Such practices as determining how decisions are made and the level of involvement of various parties in this process, employing formal goal setting versus an activity orientation, devising incentives to encourage various behaviors, and deciding whether to connect rewards with achievement of results rather than seniority have strong influences on the total system's performance.

As noted previously, the alignment between an organization's culture, vision, and structure is important. All three elements can be changed through the organization design process. In corporate culture, the design process explores and determines the existing norms and values that shape and guide daily activities. The design process identifies organization rites and rituals, the ways culture becomes communicated through management practices, the changes necessary, and how such changes may be implemented.

Design mechanisms such as philosophy and mission statements - and statements about what constitutes good management practices - can communicate and guide the design process as it addresses job design and help the remainder of the organization become aware of the new culture.

Perhaps the most visible aspect of an organization's culture is the way it chooses to design individual jobs or work roles. The design process involves making choices about what jobs include or exclude, the extent to which jobs are interconnected, the levels of autonomy associated with various jobs, and the challenges and development opportunities they offer. Choices made involving these elements have some of the strongest impacts on the organization's culture and the concomitant energy levels within it, as the daily work required by people's jobs is the setting in which the design process's best intentions either fly or falter.

Along with designing individual jobs, the design process must also consider and choose from among alternatives for connecting and aggregating jobs. This involves answering such questions as the following.

- Should people work individually, or as teams?
- How many teams should a unit have? What is the best basis for determining unit boundaries and thus avoiding over fragmentation of the work system?
- How will communication occur within the teams and among teams and units? Who will have the authority to make what kinds of decisions?
- What types of information are required by individuals? By teams? By units? By divisions? How can this be made available so that the

necessary data for self- correction is timely and accessible?

All of these decisions must be made as part of the organization design process – but only after extensively assessing how the work system currently performs. Indeed, such an assessment – consisting of the technical system analysis and social system analysis –is part of the design process. It must occur, however, before one chooses options in the areas discussed previously.

Both the analysis and subsequent design process seek to consciously and systematically create a high-performing system having the organizational characteristics described previously and leading to a situation in which

- Persons **are able** to do what is expected of them,
- Persons **want** to do these tasks, and
- Persons **are allowed** to do these tasks.

### Open sociothechnical systems

Open sociothechnical systems is an approach to designing organizations based on a theory and procedure (Pava, 1983) different from those associated with traditional design approaches. According to the perspective of open sociothechnical systems, an organization is

- Influenced by and needs to respond continually to its external environments as it converts input (i.e., raw materials or information) into output (i.e., products or services),
- Through a work system composed of a social system interacting with a technical system to convert or transform input into output,
- With the technical system consisting of any combination of techniques, machines, instructions, or tools used to produce desired output, and

- With the social system consisting of the work-related interactions among persons managing the technical systems (i.e., the transformation of input into output).

Sociotechnical theory holds that a high-performing system results from finding, through comprehensive analysis (i.e., designing), the “best match” or most mutually enhancing “fit” between the technical and social systems of an organization.

This theory of designing to achieve “joint optimization” – the best fit - substantially differs from traditional designs such as scientific management, which seeks maximum automation and job simplification. Sociotechnical theory assumes that social systems can adapt to the needs of technical systems rather easily. The drawback of the traditional approach is evident in Calvin Pava’s description of the General Motors plant in Lordstown:

[I]n 1972...labor strife dramatically underscored the need for a fundamental transformation in how work is organized. At the time, Lordstown housed America’s most technologically advanced automotive assembly line. In accord with the Taylorist principles of efficiency, automation was maximized and worker roles greatly simplified. Workers went on strike to protest the low quality of their jobs in this supposedly optimal system. Over-optimization of technology by itself and sub par development of the plant’s social system led to a deterioration in the overall performance of the facility. The Lordstown episode marked a watershed in American management of human resources. It signified the need to obtain superior performance in ways that depart from traditional reliance upon simple work and

purely technological optimization. (1983, p. 128)

The open sociotechnical systems approach to organization design not only provides a theoretical perspective, but also a specific set of participation procedures for analysis and design activities. These activities are carried out in five phases (Cotter, 1983):

- Initial planning,
- Technical systems analysis,
- Social systems analysis,
- Development of alternatives,
- Implementation planning.

Technical systems analysis involves identifying the sequence of the self-contained steps or operations for converting input into desired output. It emphasizes identifying any variances or problems occurring within each operation, how they are currently dealt with, and the consequences for operations “downstream” if variances are not adequately dealt with at the source.

Social systems analysis involves describing the existing interactions of employees, not only with respect to who controls what variances, and how this is done, but also with respect to coordination among groups and individuals, particularly in solving unexpected problems arising from unpredicted events in the organization’s external environment. Social system analysis also examines existing organizational processes for recruitment, incentives, performance evaluation, training, career management, and the like and how these influence employees’ commitment and the organization’s capacity for self-renewal and development over time.

The technical and social system analyses provide information necessary for

considering alternative organization designs. Developing and evaluating design alternatives involves assessing the extent to which possible new jobs and arrangements for connecting them do to the following:

- Allow for variances to be controlled as much as possible at their source, thereby minimizing or reducing costly work flow problems;
- Provide meaningful work as defined by the employees themselves;
- Create situations in which persons are able to, want to, and are allowed to do the tasks necessary for both the short –and long-term success of the organization.

### Processes and structures for open sociotechnical systems design

Both the theory and procedures of the open sociotechnical systems approach to organization design are of little use when implemented through a traditional process of unilaterally developing – by a staff or external consultants – analyses and recommendations. Alternatively, the open sociotechnical systems approach prescribes a heavily participative process, one in which the structures for participation are created and agreed to during the first step of the design activity sequence (the initial planning phase), which

...includes the formation of an approval body and a design team. The approval body is composed of senior managers who have a stake in the final outcome, and whose responsibility it is to guide and approve proposals from the team formed to design the new organization. The design team is charged with the task of envisioning the ideal future state, analyzing the current work system, and recommending a new organization

design to the approval body.  
(Ranney & Carder, 1974, p. 171)

### Problems with traditional approaches to organization design

By more closely exploring the dynamics of traditional approaches to organization design, we can also move closer to understanding the role of the methodology, procedures, and theoretical perspective of the open sociotechnical system's approach to the successful design of high-performing systems.

Managers and employers who have personally been involved in traditional design approaches frequently describe their experiences with them by using statements such as the following.

- “It’s what we do every five years – move from centralization to decentralization, or vice versa, often without any lasting impact on the way we really do things around here.”
- “That’s what those people in the head office do to us when they have nothing else to keep them busy.”
- “My job is to get the work done in this plant, not to spend my time worrying about academic theories.”

Traditional organizational design processes frequently evoke such unflattering images in part because managers and workers alike consider them as

- something done by one group (usually senior management or staff) to another group (usually middle managers and their subordinates),
- relatively unconnected to the operational problems of the production process, partly because they do not include any analysis of the technical or social systems,

- political maneuvers by incoming managers that will have little impact on work done on a daily basis,
- something line managers are not responsible for (“Let the personnel office do it”),
- belonging to a small set of previously used - and discarded – design “solutions” (“It’s either functional or product or matrix, so why get excited?”),
- focusing on only authority and reporting relationships (i.e., changing the boxes on an organization chart) rather than representing the more comprehensive approach of open sociotechnical systems design.

Indeed, much of the popular management literature is consistent with these characterizations. For example, the literature suggest only three or four basic organizational configurations (product, functional, matrix, or geographical), and finds the task of the staff expert (or senior management) to be to determine which of these configuration is best for the particular organization.

Experience suggests that the likelihood of successfully designing a high-performing system by using such traditional approaches is low, because such approaches

- are not based on a detailed operational analysis of actual, current work practices,
- have not meaningfully involved those persons closest to the operational process (i.e., workers and line managers),
- focus on solving only today’s – or even yesterday’s – problems rather than creating an organization capable of flexibly responding to tomorrow’s challenges,

- do not have the necessary commitment and support of those at lower levels, which are required for successful implementation,
- are based on the false assumption that modifying only authority/reporting relationships will be sufficient for obtaining intended results,
- use analytic perspectives that make the “designers” prisoners of their own histories, cultures, and traditions, and
- stem from a constraint orientation emphasizing all that cannot be changed, rather than from an inventive/creative orientation central to effective organizational change.

### Successfully implementing the open sociotechnical system approach to designing high-performing systems

The following factors must be present to achieve a successful outcome using an open sociotechnical systems approach:

- the proper analytic perspective, methodology, and procedures for focusing on the right questions (i.e., an open sociotechnical systems perspective),
- a design approach characterized by innovation, invention, and experimentation,
- analysis and design activities that involve not only technical/staff personnel and senior management, but also those who will do the actual work, and
- recognition by both the participants and those providing resources that the organization design process is a social activity with some human, nonlinear aspects and that it needs widespread, ongoing organizational support.

The fourth factor cited above emphasizes the need to consider

organization design an activity that – as much as any other key activity – must be managed so that it receives appropriate resources and widespread support, and achieves congruence between the process used and end results.<sup>2</sup>

Table 1 presents other implications for action associated with nine key dimensions moving from a traditional approach to an open sociotechnical systems approach when designing high-performing systems (Mohr, 1984).

### Conclusions

Traditional design approaches for creating high-performing systems are severely limited by inadequate theoretical frameworks, methodology, and procedures for analysis and design, and by their failure to focus on the political processes and organizational structures used for implementing open sociotechnical systems theory, methods, and procedures.

Experience suggests that successful movement along the ten dimensions discussed in Table 1 can help eliminate many of the problems associated with traditional approaches. Moreover, organizations using open sociotechnical systems approach to design will begin to effectively use organization design, one of management’s most powerful interventions for improvement. To reap the benefits available, however, management must fully understand the essential creative, human, and political nature of the actual design activities, the need for detailed operational analysis, and the need for participative structures for conducting analysis and design.

*Reprints of this article are permitted provided that the author’s name and contact information are clearly listed on each page.*

## NOTES

1. I am indebted to Peter Vaill, whose work on high-performing systems provides the origins for the notions I present on this concept.
2. These concepts, often referred to as the set of knowledge and skills related to the “management of organizational change,” are discussed in more detail by Beckhard and Harris (1977).

## REFERENCES

- Beckhard, R., & Harris, R. (1979). *Organizational transition: Managing complex change*. Reading, MA: Addison-Wesley.
- Cotter, J. (1983). *Designing organizational that work: An open socio-technical systems perspective*. Unpublished working paper.
- Mohr, B. (1985). *Art., analysis, and participation: Key dynamics in designing organizations from the open socio-technical systems perspective*. Unpublished working paper.
- Pava, C. (1983). Designing managerial and professional work for high performance: A sociotechnical approach. *National Productivity Review*, 2, 126-135.
- Ranney, J. & Carder, C. (1984). Socio-technical design methods in office settings: Two cases. *Office Technology and People*, 2, 169-184.
- Walton, R.E. (1985, March/April). From control to commitment in the workplace. *Harvard Business Review*, pp.77-84.

**Table 1**  
**Implication for Action Associated with Moving from a Traditional Approach to an Open Sociotechnical Systems Approach when Designing High-Performing Systems**

<i>Dimension</i>	<i>Movement required</i>
1. Participation	Movement from restricting analysis and design to technical specialists and senior managers toward also including operational employees, middle managers, and key organization stakeholders (e.g., union officials, personnel specialists, other staff organization members).
2. Data base	Movement from overdependence on individual perceptions and theories as to strengths and weaknesses toward a collection of detailed data on the behavioral and factual aspects of the current operational processes, which consider actual responses to operational problems (i.e., technical system factors) and specific activities of the social system intended to support goal achievement, adaptation to the environment, integrating of efforts, and long-term system development.
3. Area of inquiry	Movement from singular, exclusive foci (e.g., those limiting analysis to either structure or equipment, or to either procedures or human relations) toward a multiple, inclusive scope of inquiry that includes technology, individual differences, the organization, the environment, and management practices and styles.
4. Causality	Movement from viewing organizational elements as having simple cause-and-effects relationships (e.g. higher pay leads to increased motivation) toward a systemic understanding of multiple causes and effects, not all of which are fully predicted (although one may anticipate their existence)
5. Time orientation	Movement from emphasizing solutions for today’s – or yesterday’s – problems toward emphasizing the creation of an organizational setting capable of continual, effective progress toward clearly defined goals.
6. Design goals	Movement from an either/or orientation (e.g., one calling for choosing between economic or human goals, or between short-term responses or long-term development) toward an orientation with multiple goals (e.g., productivity and QWL, or short-term results and long-term flexibility)
7. Customization	Movement from a tendency to limit one’s choice of design solutions to the three or four structures dominating the literature toward creating a setting uniquely tailored to the organization’s own current and future needs
8. Maximization	Movement from designing either the best possible technical system or the best possible social system toward designing the sociotechnical system with the best fit.
9. Finality	Movement from expecting the organization design to be completed “once and for all” toward setting a goal of developing the appropriate skills, experience, and flexibility within the organization so that future design activity can be a part of its regular operations, not a separate activity.