Safety and Quality Issues as Part of a Holistic (i.e., Sociotechnological) Approach

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Safety and Quality Issues as Part of a Holistic (i.e., Sociotechnological) Approach

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In the past, many so-called management concepts were not very successful because of their fragmented approach. This is also true for topics like safety and quality. Here, technical aspects often predominated while disregarding the equally important need for a change of attitude. On the other hand, awareness was created by timely limited programmes.

The paper deals with integrating quality and safety in holistic (management) concepts, which are described first before being discussed in detail.

holistic approaches   Occupational Health and Safety   Quality Management
sociotechnological approaches

1. THE NECESSITY OF HOLISTIC APPROACHES

Experience in the past showed the predominance of fragmented concepts: Looking at technical systems like Computer Integrated Manufacturing (CIM), we often saw the implementation of technology without any real changes to organizational structures. Another field of experience are Knowledge-Based Systems. Often, the system development approach disregarded the users, in other words software engineering without any software ergonomics. Looking at the so-called Management Systems like Occupational Health and Safety Management, Quality Assurance and Management, or Management of Environmental Issues, for many years we put too much emphasis on technical aspects like safety or quality assurance (Rehhahn, 1974).

The results showed quite clearly that such fragmented approaches were not very helpful as they prevented the full potential of a project to

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be achieved. For example, due to lack of training, new technical systems were only partly used (e.g., using personal computers as typewriters only) or substantial resources were required for subsequent improvements, for example, for better user-friendliness (Reichwald, 1981, p. 215).

Even when talking about successful implementations of Management Systems, we experienced only moderate success rates. Often, such projects were cancelled altogether—with very bad consequences for other projects implemented later on (Champy, 1995).

Having learned all that the hard way, it is time to overcome the problems of fragmented concepts. Which demands must be fulfilled? There are several preconditions:

- a holistic concept as basis,
- an implementation process satisfying the demands of comprehensive Change Management or organizational development, and
- tools to stabilize and continuously improve.

2. CHARACTERISTICS OF HOLISTIC MANAGEMENT SYSTEMS

First of all, we have to understand organizations as sociotechnological systems. Expanding the sociotechnical approach, as used in the Tavistock model (Trist & Bamforth, 1951; Trist, Higgin, Murray, & Polloch, 1963), organizational and economic conditions should be emphasized more strongly or regarded more consciously. This is expressed by introducing the term technological (Rühl, 1973, p. 151), whereby the interpretation of an organization includes behavioral, technical, and organizational aspects respecting the economic (and ecological) frame. Similar concepts can be found in recent management literature.

According to Ulrich (Ulrich & Fluri, 1992, p. 19), there are three management dimensions: normative, strategic, and operative tasks. However, their interdependence is explicitly emphasized. They are integrated via a management philosophy clarifying the theoretical basis of everyone's actions. It determines the vision, or final objective, and supports commitment of all participants (Figure 1).

Compared with the sociotechnical approach, the St. Gallen model stresses the necessity of a commonly accepted vision as a striving force for the organization. It is deployed in a three-step process by different tools. In the sociotechnical concept we have behavioral and structural

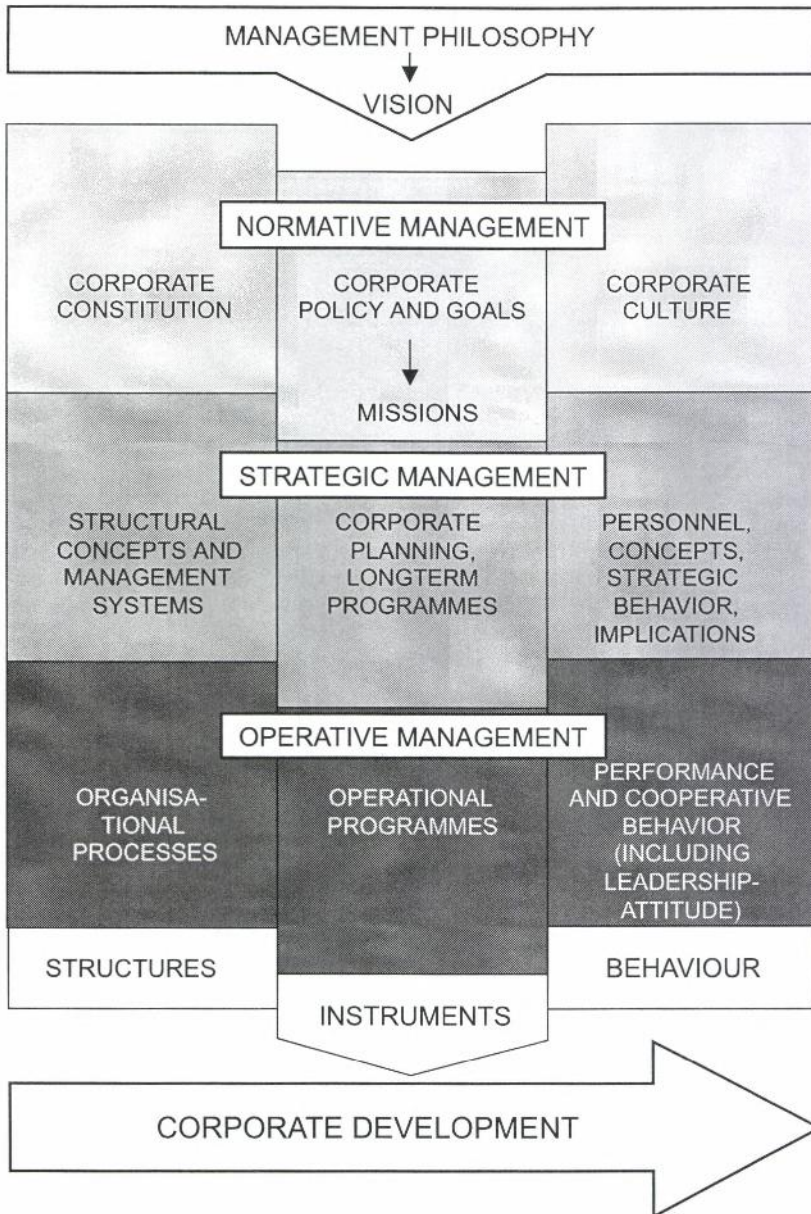**Figure 1. Normative, strategic, and operative management (cf. Bleicher, 1996, p. 72).**

dimensions. But in the St. Gallen model they are additionally structured in a normative, strategic, and operational dimension. Figure 2 shows how to integrate quality aspects into the normative frame.

The value of the model in creating a holistic approach results from its focus on harmonizing the different dimensions.
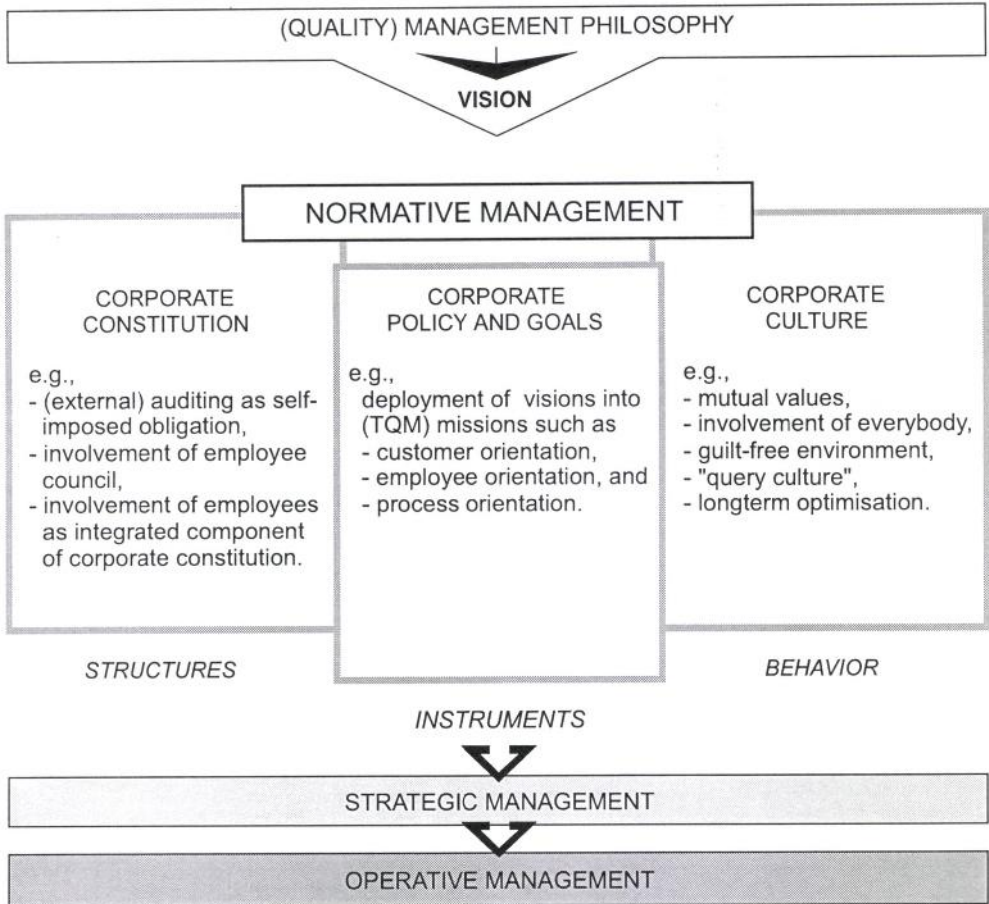
Figure 2. Quality issues integrated in the dimension of Normative Management.

According to Bleicher (1996, Figure 3) a holistic approach must integrate

- a basic fit,
- a vertical fit, and
- a horizontal fit.

Horizontal integration (fit) means, for example, that the corporate constitution is in harmony with the corporate culture and policy, and goals are based on both. *Vertical integration* includes the consistent transformation of normative elements into strategic ones, and strategic elements into operative ones. Management behavior and cooperation are determined by a strategic management concept, which, in turn, must be consistently derived from normative premises (corporate culture).

	STRUCTURES	INSTRUMENTS	BEHAVIOUR
NORMATIVE	basic fit		
STRATEGIC			vertical fit
OPERATIVE		horizontal fit	

Figure 3. Harmonizing separate management dimensions (cf. Bleicher, 1996, p. 416).

A *basic fit* means that each individual dimension is consistent in itself, for example, that there are no contradictions between different reward systems in a company.

These general statements describe the idea of a holistic management concept in principle. As shown in Figure 1, the model is based on a socio-technological systems design approach replacing fragmented concepts, and as a result suboptimization by a global optimum. By definition, it must, therefore, include a multidimensional process to set objectives.

The difficulty of its practical implementation now comes from the fact that optima can be defined for technical or even economic subsystems. However, optimal conditions for social subsystems cannot, in many cases, be expressed in a general way because of interindividual differences. Hence, all people affected have to be involved in the design process. Apart from this, it will become evident that problems will only be solved by an interdisciplinary and holistic approach (cf. Zink, 1984, p. 29). Besides understanding organizations as sociotechnological systems, a multistage process of policy deployment as shown in Figure 1 is needed.

According to ISO 8402, Total Quality Management is defined as a "Management approach of an organization, centered on quality, based on the participation of all its members and aiming at long-term success through customer satisfaction and benefits to all members of the organization and to society" (Deutsches Institut für Normung, 1995, p. 4). There is obviously a broad basic philosophy including quality, occupational health and safety (members of the organization), and environmental issues (society).

All these aspects (including economic goals) have to be part of a goal development process, which should be realized as top-down and bottom-up process (the "catch ball" principle). The deployment of the commonly agreed goals should be a multistage top-down process involving the whole management to show their commitment (and not adding to the organization).

To realize such a holistic concept—so far only described in theory—a comprehensive approach to Change Management is needed (Figure 4).
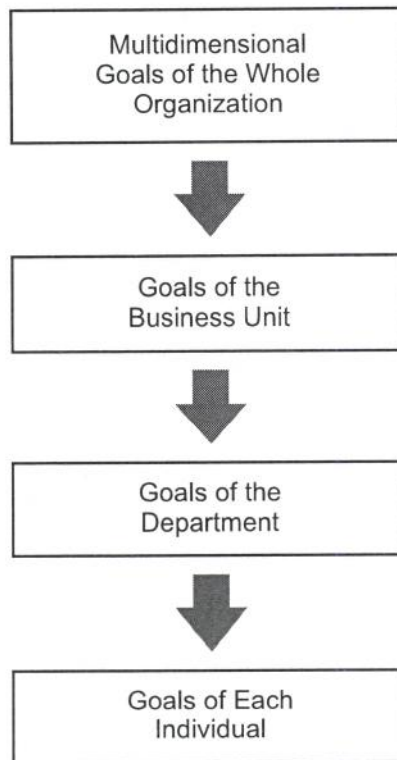

Figure 4. Policy Deployment Process (in principle).

3. EXEMPLARY DEMANDS ON A COMPREHENSIVE
CHANGE MANAGEMENT
(see also Zink, 1997b)

Comprehensive Change Management means to have a vision of the goals and to link personnel and structural measures to realize these goals. The change process is connected with the use of different methods

and tools. The constituents of such an approach are summarized in Figure 5.
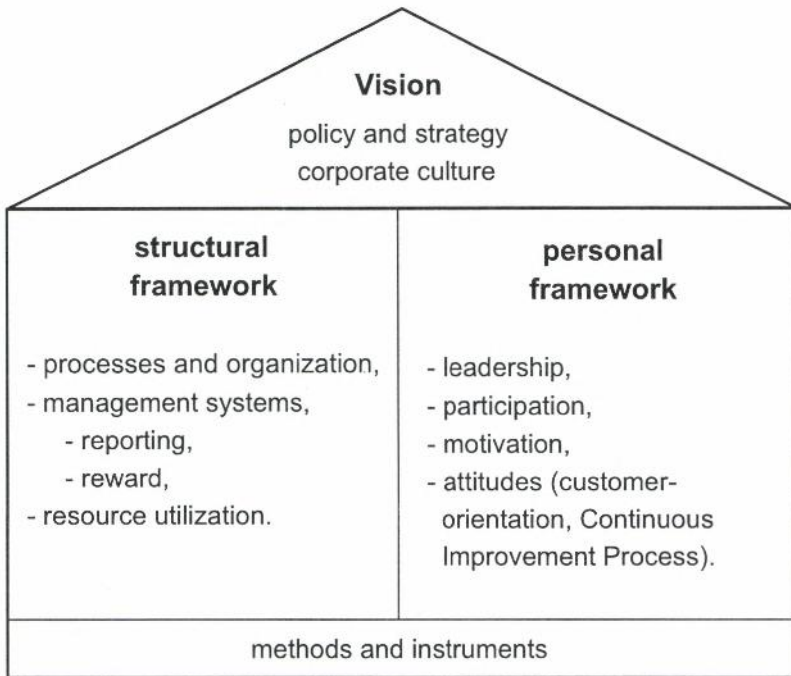
Figure 5. Exemplary general framework for the introduction of a TQM concept.

A multidimensional approach including health and safety, quality, environmental issues, and an underlying corporate culture requires an adequate foundation. Dealing with personnel aspects, attitudes and—as a consequence—behavioral patterns need to be changed. When introducing Total Quality Management, customer orientation and continuous improvement must become core elements of attitudes and behavior. With Occupational Health and Safety, management has to accept a stakeholder approach in considering people's safety equally important as business results. Therefore, sometimes paradigms have to change.

At this point, the commitment of senior management to change is crucial. This means

- senior managers have to understand the new concepts. This is only possible if they spend time on information and training;
- they have to be convinced that the new way is helping them to solve problems better than the old way did.

Information and training are important for all others, too. But that is not enough. Changing attitudes also requires changing structures. This structural framework includes at least (cf. Zink, 1994, p. 30)

- restructuring the organization (e.g., to be more customer-oriented) or introducing supportive organization structures (e.g., to involve employees in improvement processes);
- restructuring the information or reporting system to include all relevant topics like health and safety, quality, or environmental issues instead of only delivering information about costs;
- restructuring reward or payment systems to reflect multidimensional objectives.

Another important point is to involve management. This includes policy deployment, information, and training, which should become cascaded. Such a process is shown in Figure 6.
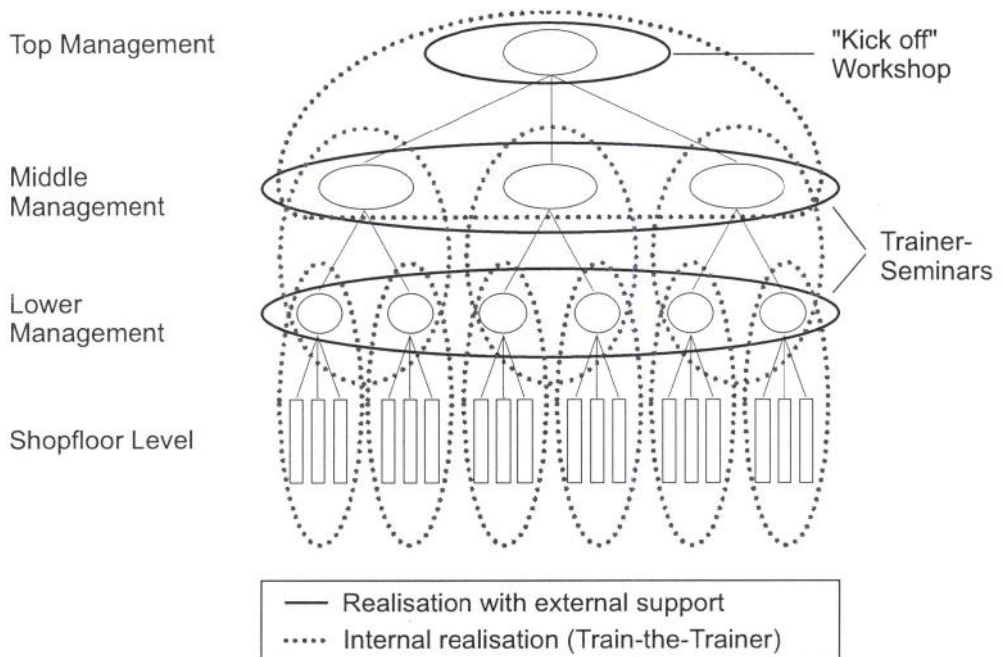

Figure 6. Top-down training concept (Train-the-trainer, Zink, 1998b, p. 53).

This top-down approach ensures that the information (and training) process is part of normal structures—and managers inform their employees. In problem solving, top-down and bottom-up approaches can, of

course, supplement each other. Managers should be part of project groups or task forces; at least playing the role of a promoter. This might be as a member of a steering committee or in promoting a team. The involvement of the affected people is shown for health and safety in Figure 7.

The last point to mention here is the necessity to stabilize and continuously improve the new system. This can be achieved by a multi-
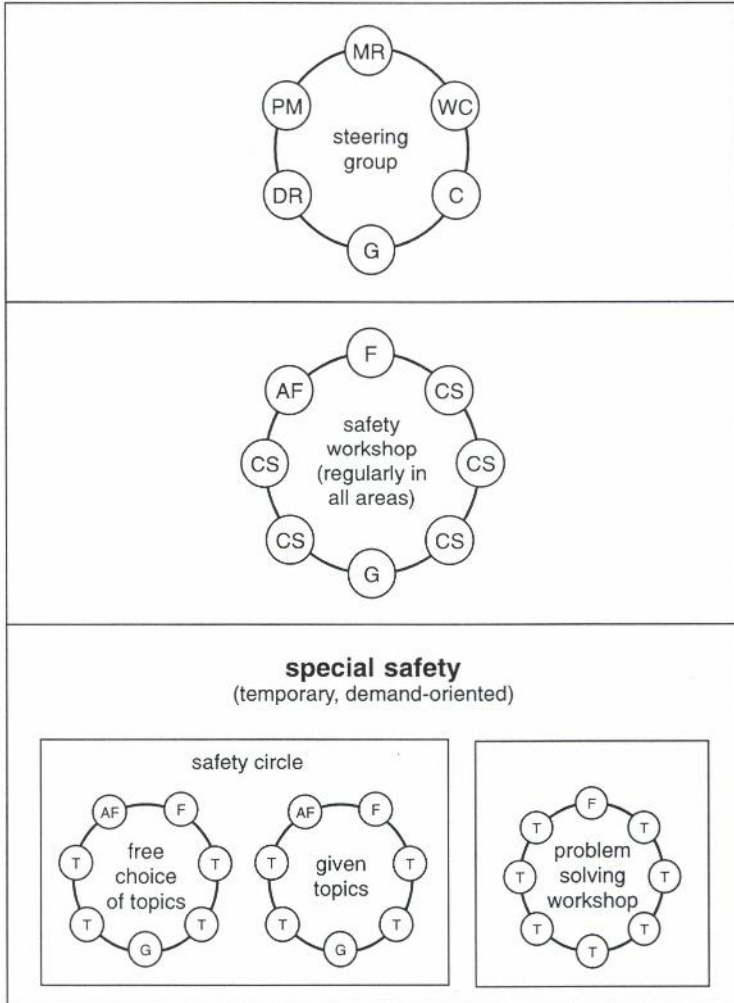
Figure 7. Organization of Safety Teams (Zink, 1997a, p. 129). *Notes.* MR—management representatives; WC—works council representatives; PM—personnel manager; DR—representatives of different departments; C—coordinator (e.g., safety engineer); F—facilitator (e.g., foreman); AF—assistant facilitator (e.g., safety manager); CS—co-workers at the shopfloor level; T—team members; G—guest.

dimensional rating or assessment system. Such systems can be found in Total Quality Management or Business Excellence. They exist in the assessment models for international quality awards like the European Quality Award (see European Foundation for Quality Management, 1997) or the U.S. Malcolm Baldrige National Quality Award (see U.S. Department of Commerce, 1997). We used the European Quality Award to develop an evaluation concept for health care prevention (Figure 8; see Zink, 1998a):
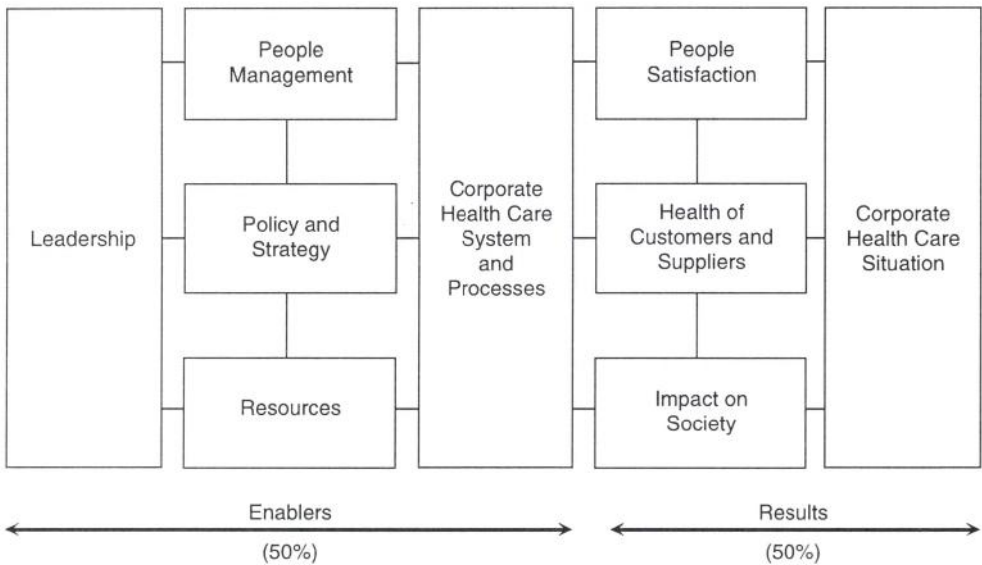

Figure 8. Evaluation concept for Health Care Prevention.

The same approach can be taken for assessing (Total) Quality or Occupational Health and Safety. One advantage in using models like this is that they are designed in the "language" of management and, therefore, can be understood easily. Another point is that assessment results have to be regarded in the normal business planning process of the organization.

4. SUMMARY AND CONCLUSIONS

To realize quality, safety, and environmental issues, they have to be part of a company's (organization's) policy and strategy. The introduction of all three topics should follow the same process (as a comprehensive

change process based on a sociotechnological approach). Fragmented approaches are too expensive and—in most cases—unnecessary. A socio-technological approach, on the other hand, is able to integrate all (previously separate) activities as modules of a single holistic concept.

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