Embodiments of Organizational Fitness: The Viable System Model (VSM) as a Guide

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Received May 15, 1989; revised December 2, 1989

Managers are facing new problems in their quest for organizational fitness. With environments of growing complexity, foresight, adaptability, and learning become critical features for a social system to survive and develop. Established models of organizational control are insufficient to cope with this proliferating complexity. The science of cybernetics provides powerful models to master this key challenge to management. The present article offers a synthesis of Beer's Viable System Model (VSM) and a multilevel concept of organizational fitness, based on recent progress made in the field of planning theory.

KEY WORDS: organizational effectiveness; Viable System Model (VSM); planning theory; control systems.

1. THE LIMITATIONS OF TRADITIONAL CONCEPTS

What is it that makes an organization efficient? What is the grounding of organizational effectiveness? These are recurrent questions that preoccupy managers and management research. Depending on the underlying perspectives, the answers have been various, often controversial, and mostly of dubious value.

Chiefly, the role of efficiency has been overestimated, leading to a neglect of higher-order levels of effectiveness. To put it in more precise categories: short-term thinking has frequently driven out long-term orientation. Despite the growing body of literature on corporate strategy, a team of leading researchers from MIT recently observed that American industry has been "handicapped by shrinking time horizons and a growing preoccupation with

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short-term profits" (Berger *et al.*, 1989, p. 25). If these authors ask why U.S. firms are "less willing than their rivals to live through a period of heavy investment and meagre returns in order to build expertise," this may remind one of John Ruskin's lament, put forward more than a hundred years ago: "We pour our whole masculine energy into the false business of money-making" (1865, p. 88).

This is not an article to deny the importance of profits as such. In the long run, no business can survive without being profitable. Profits are a prerequisite to reinvest and maintain the substance of a company. In Peter Drucker's precise wording, profits are "the costs of staying in business" (1980, 28ff.)

If profit is a necessary precondition for survival, profit-mindedness is not sufficient to guarantee the viability of a company. On the contrary, the frequently quoted goal of "profit maximization," in the long run turns out to be an obstacle to achieving superior performance.

In a context of rapid change, both level of profits and stock prices are inadequate measures of organizational effectiveness. They are, in principle, no more than short-term indicators of business achievement.

Let me resort to an analogy: assessing the effectiveness of a business by the level of its profits is similar to drawing conclusions about what season it is by measuring the temperature. For this aim, the calendar, and definitely not the temperature, would be the appropriate source of information.

Like the temperature in the sphere of climate, profit is an inherently short-term indicator in the world of business. Long-term patterns are driven by different causal factors and relationships. Therefore, to deal with them adequately, a different logic and a different language are necessary.

It would be wrong to stipulate that profit is worthless as an indicator for management: since Luca Pacioli invented double-entry bookkeeping in 1494, most firms have made use of this valuable instrument and they have continued to use it, in a more or less unchanged way, to keep track of revenues, costs, and resulting profits. Yet despite its fundamental usefulness, that toolbox is likely to mislead managers if it is used to draw lessons which it cannot deliver: the profit-and-loss statement is an appropriate model of the economic state of a business at the operational level. However, signals drawn from it to determine strategy very probably point precisely in the wrong direction. In the light of recent insights from planning theory (Gälweiler, 1987; Drucker, 1979), it is an error to consider profits a strategic goal, as does much of the literature on strategy (for details see Schwaninger, 1989). Yet many companies are still being "steered" mainly on the basis of the traditional accounting figures.

In times of economic stability and in periods of continuous growth, the shortcomings of these approaches to control do not "get to the surface." But

in a context of instability and dynamic transformation, corporations that are managed exclusively from the perspective of "profit-mindedness" easily become the victims of their myopia. This has been impressively demonstrated by a growing failure rate of companies in industrialised countries, as a consequence of the increasing turbulence in the world's economy during the seventies and eighties.

As the threats to organizational viability have grown, traditional concepts of control have increasingly become obsolete.

There is no doubt that management theorists have made substantial efforts to treat organizational effectiveness in a broader perspective. The abundant literature on this subject has produced interesting propositions. Yet for the time being, the state of the art is still considered immature, incoherent, and thereby unsatisfactory, by the experts in the field (compare Cameron and Whetten, 1983, p. 1; Goodman and Pennings, 1977, 2ff.; Miles, 1980, 353ff.; Zammuto, 1982, 21ff.).

To conclude, a new understanding, rooted in a more comprehensive view of organizational fitness, is needed, which integrates the multiple perspectives of organizational theory (Cameron and Whetten, 1983, 274ff.). Two areas of scientific progress appear to be of particular significance to meet this requirement: management cybernetics and planning theory.

The aim of this article is to shed some light on the insights underlying a new approach to organizational fitness, which has emerged from a synthesis of concepts from both areas. In line with the leitmotif of this journal, the theoretical discourse is illustrated making use of examples from applied research.

The structure of this paper is given by the three core tasks of management as pronounced by Hans Ulrich (1984) of the University of St. Gall: designing, controlling and developing organizations (and other types of social systems).

2. DESIGN FOR FITNESS: THE VSM AS A GUIDE

Management cybernetics starts out from the fundamental concept of complexity. It conceives management in terms of mastering complexity. This approach paves the way toward very powerful models and methods which enable us to get closer to an integrated or holistic management.

Of course, there is nothing new in being compelled to reduce complexity. Cybernetics, however, helps us to appreciate which types of complexity reduction are likely to be effective. Reductionism and ignorance, too, curb complexity, but they are likely to violate Ashby's law of requisite variety: "Only variety can destroy variety" (Ashby, 1964, p. 207). In order to be

Fig. 1. The corporate structure represented in terms of Beer's VSM.

effective, a control system must include a repertory of potential behavior patterns that is on a par with those of the system to be controlled.

Design means creating and maintaining an institution as an operational entity in such a way that it is able to fulfill its functions while remaining capable of control and development (Krieg, 1985, p. 262).

The following case illustrates this point. It refers to one, among many, corporations in which the author has worked in an advisory and supervisory capacity. This example is of particular interest since it is one of the few cases in which the corporation's development was systematically examined after 5 years of the initial intervention.

In this case we used the VSM as a guide to understand and revise its organization structure. In brief, these were the main features of the corporation.

- (i) It consisted of several autonomous units (A, B, C and D in Fig. 1). Each of these represented a business in its own right and operated in clearly defined markets, even though there were overlaps. The

units were two clinics, a hotel and bathing facilities. Each of these units had the legal form of an independent company and had its own management (identified by "1" in Fig 1.).

- (ii) Previously, these companies had operated independently of each other. A short time before our intervention, they had been united in a holding corporation. The reasons for this alliance were administrative considerations. A holding management (identified by "3" in Fig. 1) had been set up, to control (in a cybernetic sense) all the individual company managements, as indicated by the vertical axis in the diagram.
- (iii) A number of centralized services—finance and accounts, personnel, technology—fulfilled certain coordinatory functions, but there were additional coordinating and antioscillatory mechanisms (identified by "2" in Fig. 1), as well as monitoring facilities, which would not be included in a customary organizational chart.

The representation so far, in simple terms, portrays the corporation as it worked at the time of our cooperation. In fact it functioned rather well; day-to-day business was handled efficiently. The corporation enjoyed a good reputation, both with customers and in the industry as a whole. The new holding structure was to allow for a realization of economic and organizational synergies.

And yet the corporation lacked an orientation toward a wider environment within a long-term horizon. Would the present-day mode of handling business still be adequate in the future? Were markets and technologies posing new challenges? Firms that give too little heed to such questions are continually getting into difficulties, or even failing completely.

- (iv) For this reason a unit was set up with particular responsibility to develop a comprehensive and long-term orientation for the corporation (Unit "4" in Fig. 1). A working team of 17 persons was formed who gathered in workshops to look at the situation from a long-term perspective and to redefine strategies. In accordance with our proposal, this working team consisted of a heterogeneous circle of front-line managers, from the Chairman of the Board to Deputy Heads. The motive was twofold:

- (a) it was ensured that a variety of organizational levels contributed to the project, and
- (b) the team was multidisciplinary, with different professional backgrounds, comprising business administrators, technicians and medical doctors (because some of the companies concerned were clinics).

In this way, optimal preconditions were created for a really interdisciplinary approach, which would be equal to the importance, the wide span, and the intricacy of the problems at hand.

The composition of the strategy team reflected the requirement that a problem should not be solved in isolation from its environment. All the board members on the team were at the same local councillors, among them the mayor. Thus, and adequate linkage with the next level up, the Local Authority, was guaranteed.

- (v) Of course, often there will be discrepancies in a corporation between the persons concerned primarily with the day-to-day operational business and those concerned with the long-term ideas. Integrating those different viewpoints calls for a supraordinate management system (System "5" in Fig. 1). Balance is required
 - (a) on the other hand, between internal and external orientation; and
 - (b) on the other hand, between long-term requirements and short-term possibilities.

In order to discharge these tasks System 5 needs to contain an extremely rich model of the relevant reality: a model that satisfies Ashby's law (cited above). In a democracy, this system is formed by those representing the people in parliament on the basis of a constitution. As far as corporations are concerned, one is inclined to ascribe this function to a board of directors or to a supervisory board. This however, could be a serious oversimplification in many cases.

The description just expounded is based on Stafford Beer's Viable System Model (for details, cf. Beer, 1979, 1981, 1985; Espejo and Harnden, 1989). The theory that provides the foundation for this model can be summarized as follows.

To be viable a social system needs to have the five functions outlined above. Among these five functions, patterns of interactions must take place which are precisely defined in theory, but only briefly sketched here. If one or more of these functions either is missing or has inadequate capacity, or if the interactions are disturbed, then the viability of the system in question is likely to be impaired, if not endangered.

Theory further argues that this structure is recursive: in order to be viable, both subsystems and supersystems must obey the same structural principles. Each recursion level has the following.

- (i) Primary activities (autonomous units).
- (ii) Coordinating devices.
- (iii) A control function.

These are the functions of operational management. They regulate corporate activities in the "inside and now" and the short-term future.

- (iv) "Intelligence", or strategic management: it deals with the more comprehensive environment and the long term ("outside and then").

- (v) The “cerebral cortex”, or normative management, whose task it is to guarantee a balance between inside and outside, between the short and the long term, by means of norms.

A solid future cannot, however, be built solely by creating a new structure. For this reason it was necessary, in our real-life case, to find a common thrust, a strategy for the corporation and its business areas.

Consequently, a number of radical corporate and strategic decisions were worked out (for details see Schwaninger, 1988).

3. CONTROL: A NEW CONCEPT OF ORGANIZATIONAL FITNESS

So much for the structural conditions for an operational entity to be capable of effective action.

But how must it function in order to achieve comprehensive organizational fitness? For this purpose a corporation must be able to control itself. After all, cybernetics assigns priority to self-control and self-organization.

Effective control implies a dynamic equilibrium, at a satisfactory level of performance between a corporation (or an organizational unit) and its environment. But which variables define adequate performance? This is not only a problem of control, but a fundamental epistemological problem.

Traditional control models take their bearings largely or exclusively from the goal of “profit”. It has been demonstrated that such models no longer meet today’s requirements. Under the evolutionary pressure of increasing complexity and turbulence, important progress had been made with regard to criteria of competent management.

The essence of this progress is based on the insight that one and the same system must govern itself with the help of control variables that may contradict each other because they belong to different logical levels: the levels of operational, strategic, and normative management (Fig. 2).

The control variables essential to the operational level are solvency and profit. Ever since the invention of double-entry bookkeeping, we have been aware that these are two distinct objects of thought and action (previously, this had not been known).

Only recently, however, has there emerged a “practical” theory providing access to higher-order criteria. This concerns “value potentials,” which can be seen to “precontrol” profit, much as profit determines solvency.

Similarly to the way in which profit largely determines solvency, value potentials precontrol profit. Value potentials are defined as the texture of all applicable business-specific, profit relevant *pre-requisites* that must exist when the profits have to be realized (Gälweiler, 1987; cf. Pümpin, 1990). Value potentials must be controlled separately from profit and solvency,

Fig. 2. Goal categories and control variables at different logical levels of management (based on Schwaninger, 1989).

on the basis of independent criteria. It is only recent work in strategic management that has clarified the nature of these criteria. They include how to apprehend the critical success factors in a given business system, how to change its structure, taking into account the dynamics of customer problems, problem solutions, technological substitution, and the value chain.

With regard to the corporate level, strategic methodologies still retain blurred spots and edges. However, for strategic business units a mature methodology has recently become accessible. This methodology has made apparent the "essential" variables of the strategic level as did bookkeeping for the operational level. Mainly Gälweiler (1987), but also Porter (1980, 1985), Schwaninger (1987, 1989), and several other authors have elaborated on this new methodological concept.

Thus profit is not a strategic control variable and consequently, not a strategic aim either. Rather, its appearance or absence is a consequence of good or bad strategies. This divergence from the traditional view, which regarded profit as "the fundamental corporate objective," has also been expressed, in a certain sense, by more recent attempts to integrate finance theory into strategy considerations (cf., e.g., Rappaport, 1986).

Meanwhile, insights into the reference variables of the normative level have also improved. The work in question is based primarily on the framework

of systems theory and cybernetics and, once more, presents independent criteria for the assessment of the viability and development of organizations.

Viability, understood as the maintenance of identity, i.e., a distinct configuration which makes a system identifiable as such, can be assessed on the grounds of structural considerations, which are not bound by the indicators employed at the strategic and operational levels. The most advanced theory available for this purpose is Stafford Beer's VSM (see Section 2). As far as the "soft factors" of organization are concerned—referred to under the common denominator of "culture"—some models have been elaborated which, for the time being, appear more appropriate for description and diagnosis than for design purposes (Deal and Kennedy, 1982). At this level of development—defined as a system's growing potential to fulfill its own and others' needs (cf. Ackoff, 1981, p. 35)—indicators get even more hazy. Yet social systems theories provide important insights to improve the diagnosis of a system's propensity for development as functions of properties such as openness and instability and the nature of a system's trajectories. Furthermore criteria such as catalytic reinforcement, consensus, and self-governance help us judge whether a change process qualifies as "development" (Etzioni, 1968; Jantsch and Waddington, 1976).

In sum, the field of indicators at the normative level is multifaceted; social, political, cultural, and ecological aspects have to be taken into consideration. Multiple constituents and viewpoints ascribe different purposes to a social system, which leads to an emphasis on different criteria of effectiveness (Espejo, 1989). The concept of control which applies at this level is in a certain sense incompatible with the understanding derived from traditional (Western) science: instability is no longer a feature to be eliminated, but a necessary and respected precondition of development (cf. Prigogine, 1989) which control must maintain within acceptable levels.

As some recent publications demonstrate (e.g., Venkatraman and Ramanujan, 1986), serious efforts are under way to operationalize the "soft" variables and their interrelationships with "hard" performance figures, but there is still a long way to go. The following two examples will be of interest in this context. First, comprehensive empirical studies on more than 3000 business units (PIMS data base; cf. Buzzell/Gale, 1987) indicate that strategic variables account for 70% of the variance in the ROI—return on investment—while only 30% are explained by those representing operational decisions and tactical skills. Second, a study on a smaller sample of Fortune 1000 firms leads to the conclusion that the calculated impact of organizational factors on profit rates is twice as high as the influence of economic factors (Hansen and Wernerfelt, 1989).

So much for a survey of the control variables and their pertinent criteria. It must be noted that they cannot be compared in every respect, since they

Fig. 3. Integral management as a multilevel control cycle (simplified diagram for a recursion level y).

belong to three different logical levels. The variables regulated at one level represent the (precontrol) parameters for the next level down.

Figure 2 illustrates that operational, strategic and normative management are by no means three subsystems detached from each other; rather, each higher level envelops all those below it. This figure further demonstrates that the relevant time horizon increases from operational to normative management. At the same time, the factual horizon is also extended, as is complexity. The dotted arrows indicate that certain principles relevant to normative management (e.g., ethical and aesthetic ones) are largely timeless.

The diagram also shows that the concerns of the higher levels must not be detached from those of the lower levels. In fact they have to be integrated. A company can survive only if it is in possession of value potentials and if those are actualized, that is, converted into profits. An equilibrium between the sacrifices incurred in building up value potentials and reaping their fruits is a further necessary precondition of viability which normative management has to ensure.

At the three levels of management, different criteria of organizational fitness—or, to speak more generally, “systemic effectiveness”—apply.

- (1) at the operational level, it is the criterion of economic efficiency/profitability;

- (2) at the strategic level, capability in the competitive and in the cooperative senses; and
- (3) at the normative level legitimacy, defined as the potential to fulfill the claims of all relevant stakeholders.

The key duty of an integral management is, therefore, to meet all three requirements in the long run. In other words, the challenge consists in assuring that the corporation will be *successful* in operational terms, *intelligent* (respectively *on course*) in strategic terms, and *valuable* in normative terms.

In order to achieve such a delicate task, a corporation will require a considerably more complex control system than the simple feedback control systems traditionally used (illustration of this given by Schwaninger, 1989).

The hierarchy of control variables delineated here results in a *multilevel control structure* (presented in condensed form in Fig. 3), which makes clear that one and the same state of affairs cannot be precontrolled by means of the same variable with which it is controlled.

If in this structure—as indicated in the lowest cycle—control is effected toward profit (by means of the pertinent control variables: revenue and costs), then profit cannot be precontrolled with the usual accounting variables; rather, other variables are required (this is represented by the solid lines which connect one cycle with the one immediately in front of it). This is why profit is not a strategic goal.

To return to the case study, integral management for the corporation in question meant that it was steered on the basis of the control variables at all three levels.

The joint planning project described above initiated a process whereby the then exclusively profit-orientated control by means of budgets was complemented by using higher-order goals: “value potential,” “viability,” and “development.” In a changing environment, this resulted in a development process.

4. DEVELOPMENT: ORGANIZATIONAL FITNESS IN ACTION

Surprising systematic manifestations occur in social organizations, if their potentials are realized. From the point of view of cybernetics, corporate development processes are not the outcome of chance. They are corporation-wide processes obeying an evolutionary logic. As such, they can—within limits—be influenced in the sense of a “planned evolution.” Thereby, as this example illustrates, the catalytic reinforcement of autodynamic forces in the system plays a crucial part. On a higher level, however, the development process itself is also the object of design and control measures (cf. Krieg, 1985).

Fig. 4. Evolution of the business (case illustration).

What was the outcome of the effort to initiate and pursue such a development process in the case described?

I do not wish to be interpreted as presenting an instance where people succeeded simply because they followed the advice they were given. Although many projects of this kind have been completed, this one was the first whose effects were examined systematically after a sufficient time interval.

Let us have a look at how the corporation presents itself 5 years after the conclusion of the project. In the interim it has undergone considerable development. Among other things, it has integrated two new companies and coped with radical organizational and technological restructuring, in both cases with success.

This is not the place to analyze details of its commercial evolution, in terms of market shares, turnover figures, etc. Since this is a pilot study, they would not be representative in any case.

What is of interest, however, is an exemplary process pattern, which has also been observed in numerous other cases: Fig. 4 shows the evolution of both the volume of business—inflation-corrected—and the capacity utilization. Overall, both quantities increased between year 4 and year 9. The graph, however, displays a dip: the industry-specific crisis in years 5 and 6, and the concomitant drop in business evolution, had already been programmed at the planning stage (fourth quarter of year 3 and first quarter of year 4); it had thus been foreseen. In comparison with many other companies of this industry, the corporation concerned weathered this crisis relatively well.

Note that from year 4 to 6, the corporation continued to invest on a massive scale despite serious decreases in revenue (Fig. 5). Constantly and

Fig. 5. Accumulated investment (case illustration).

unswervingly, it adhered to its strategic orientation despite enormous difficulty in staying the course. In spite of temporary operative losses, investment in the development of the value potentials continued. This went so far that the corporation realized the largest investments during a period in which, from an operational point of view, it was faring worst.

To sum up an essential lesson drawn from the case: the management were not thrown off course by the slump, nor did they overreact as is often observed in such cases. This perseverance bore fruit only because it was directed to higher ends. Without strategy, the forces available would probably have been used only half-heartedly. Dissipation would have been a further consequence. In cybernetic terms: the corporation was managed on the basis of a multilevel system of control variables (Fig. 6).

Through a rigorous "follow-up," a significant learning effect was discovered both in the corporation as a whole and among managers in particular (Schwaninger, 1988). The extensive inquiry led to a clear conclusion: the planning process had strikingly enhanced the "intelligence" of the organization—openness, learning, and adaptability. Examinations of other applications corroborate these results (cf. Schwaninger, 1989, p. 134ff.). Managers consciously detached themselves from conventional, one-dimensional control approaches, and instead they oriented their actions with the support of a comprehensive concept of organizational fitness.

5. SYNTHESIS

A shortcoming of established "business administration" approaches lies in the low variety of their theories to support the design and control of

Fig. 6. Reference variables of a viable organization (left graph based on Beer, 1981, p. 130).

organizations. This shortcoming has become acute as more requirements for prospective adaptation and structural change have emerged. In this situation, as expected, new methods and tools to cope with complexity have become available through powerful models of management cybernetics and recent progress in planning theory.

The science of cybernetics furnishes a different way of looking at organizations, from which an "integral" concept of management can be derived. Such an approach implies a multilevel understanding of organizational fitness, which embraces several logical levels. Each of these levels has to be dealt with in a distinct language, but all of them have to be taken into account at any given point in time. More precisely, the control variables of all three levels have to be managed and balanced out simultaneously.

This concept results in more than a mere enumeration of criteria of effectiveness. The VSM applied in the context of such an "integral" approach facilitates a holistic design and control of social systems for viability and development.

- (1) It enables organizations to structure and restructure themselves as whole entities capable of conscious actions.
- (2) It helps them to control themselves so that they are not only successful in the short run, but also able to behave "intelligently" (stay on course), and in a valuable manner, in relation to higher-order systems, in the long run.
- (3) It delivers a conceptual framework for an understanding of restructuring and learning as an organization-wide process which can be supported appropriately.

As the example demonstrates, such a framework opens a path to "fitness" in a far-reaching sense. It develops new faculties in organizations to adapt to an environment in constant transformation and to shape it creatively in a process of coevolution.

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