

THE VIABLE SYSTEM MODEL

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Viabale System Model

The Viable System Model (VSM) was described by British cybernetician Stafford Beer in his books *Brain of the Firm* (1972), *The Heart of Enterprise* (1979), and *Diagnosing the System for Organizations* (1985). The VSM is a model of organizational structure that is based on the structure of the human nervous system. Beer notes that the human nervous system as a device for information processing and decision-making is the result of millions of years of evolution. Imitating it may have some advantages. The Viable System Model is based on Ross Ashby's theory of adaptive behavior and his Law of Requisite Variety. For a further explanation of Ashby's work, see the definition of "cybernetics."

Conceptual Overview

The Viable System Model identifies five management functions within an adaptive system. System one consists of the units that do the basic work of the organization, for example manufacturing products or delivering services. System two consists of units that handle coordination and scheduling among the system ones. System two activities include allocating space and equipment and enforcing rules and procedures. System three is the middle management function, except that its primary activity is to make a "resource bargain" with the system ones. That is, system three makes resources available in exchange for a commitment by the system ones to meet certain objectives that are agreed upon. System four is responsible for long-range planning and the design of new products and services. Whereas system three is responsible for activities "inside and now," system four is responsible for activities "outside and then." System five manages the interaction between systems three and four and embodies the corporate ethos. Hence, system five decides the identity of the firm and its governing principles and norms. This includes decisions about the kinds of businesses to be developed by system four and to be put into operation by systems three, two and one.

A key feature of the VSM is the management of variety. The people in an organization need information to perform their jobs effectively, but too much information can be a distraction. What is needed is both variety attenuation and variety amplification. An example of variety attenuation is the environmental scanning activity. Some people in an organization must keep up with new technology, new government regulations, and what competitors are doing. From a great variety of sources of information, they select the information that is most important for the decisions the firm must make. Variety amplification, on the other hand, refers, for example, to the distribution of the organization's messages. Advertising messages go outside the firm. Plans, policies and procedures need to be distributed within the firm. The VSM is very useful as a guide to studying where variety is attenuated, where it is amplified, and if there is a balance in the varieties of interacting sub-systems.

The VSM is recursive, meaning that it applies to all levels of an organization. For example, consider General Motors. Within this large corporation the primary divisions or product lines are Chevrolet, Pontiac, Buick, Oldsmobile and Cadillac. At the corporate level each division would be considered a system one. System two would coordinate activities and policies among the divisions. System three would allocate resources among the divisions. System four would consider starting or stopping various product lines, such as sport cars, sport utility vehicles, or hybrid vehicles. System five would make the final decision, and hence regulate the rate of innovation, and the kind of businesses to engage in.

Within the Chevrolet division, the system ones might be different manufacturing plants. System two would coordinate interaction among the manufacturing plants. System three would allocate funds for the operation of the different plants. System four would consider whether new car models or new manufacturing facilities are needed. System five would decide when to phase in new models or manufacturing methods. The task of system five is to insure that the organization is adaptive.

A lower level of recursion would be different production lines within a manufacturing plant. The levels of recursion go down as far as the individual who must both carry out assigned tasks (systems one, two, and three) and consider whether he or she wants to change jobs or obtain more schooling (system four). Finally, he or she has to ponder these considerations in the light of basic personal values.

The fact that system three (middle management) does not supervise the system ones (the producing units) in detail but only makes a “resource bargain” with them provides the system ones with high levels of autonomy. This approach to management is quite compatible with today’s highly educated workers and large spans of control.

The VSM is a useful guide for knowledge management. The model explains what structures and procedures are needed at each level of an organization and hence what information and what decisions are needed in each part of the organization. By providing a single model of activities at all levels of the organization, the VSM increases awareness, and knowledge, among employees of how the organization functions.

Critical Commentary & Future Directions

The VSM emerged from the field of cybernetics which sought to design information processing and decision-making machinery using the structure of the nervous system as a guide. The idea was to study neurophysiology, develop a theory of how the brain works and then use that theory to design information processing equipment. This approach was used by Norbert Wiener to create a radar-guided anti-aircraft gun, which was installed on ships in the Pacific during World War II. Stafford Beer used the same approach to create the Viable System Model.

The largest application of the VSM was probably in Chile during the Presidency of Salvador Allende. Whereas during World War II those doing operations research and those doing covert action were working on the same side against the Axis Powers, in Chile the operations researchers (Beer) and the covert action operators (the CIA) were on opposite sides. Beer, working with Allende, was trying to make the economy prosper. The CIA was trying to destabilize the Allende government. As a result of CIA propaganda, many managers left the country after Allende was elected. This left the country with a shortage of people with management experience. To keep firms operating and hence to maintain employment, Allende and his staff asked Beer for help. Beer taught the VSM to managers across Chile, and he set up a system to report on how firms were performing in order to allocate management experience efficiently.

Few organizations have adopted the VSM as their formal organizational structure, but many consultants have used the VSM as a guide for diagnosing the way an organization is operating and where improvements are needed. Efforts are being made to provide software support for VSM applications. Another area of current research is combining the VSM with other system methodologies, such as System Dynamics.

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See also Cybernetics, Autopoiesis, Structured Design Process

Further Readings and References

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