What Is a System?

Simply put, a system is an organized collection of parts (or subsystems) that are highly integrated to accomplish an overall goal. The system has various inputs, which go through certain processes to produce certain outputs, which together, accomplish the overall desired goal for the system.

So a system is usually made up of many smaller systems, or subsystems. For example, an organization is made up of many administrative and management functions, products, services, groups and individuals. If one part of the system is changed, the nature of the overall system is changed, as well.

Systems range from simple to complex. There are numerous types of systems. For example, there are biological systems (for example, the heart), mechanical systems (for example, a thermostat), human/mechanical systems (for example, riding a bicycle), ecological systems (for example, predator/prey) and social systems (for example, groups, supply and demand and also friendship).

Complex systems, such as social systems, are comprised of numerous subsystems, as well. These subsystems are arranged in hierarchies, and integrated to accomplish the overall goal of the overall system. Each subsystem has its own boundaries of sorts, and includes various inputs, processes, outputs and outcomes geared to accomplish an overall goal for the subsystem. Complex systems usually interact with their environments and are, thus, open systems.

A high-functioning system continually exchanges feedback among its various parts to ensure that they remain closely aligned and focused on achieving the goal of the system. If any of the parts or activities in the system seems weakened or misaligned, the system makes necessary adjustments to more effectively achieve its goals. Consequently, a system is systematic.

A pile of sand is not a system. If you remove a sand particle, you have still got a pile of sand. However, a functioning car is a system. Remove the carburetor and you have no longer got a working car.

See "Systems Thinking, Chaos Theory and Tools" on page 494 in Appendix D for recommended readings to understand more about chaos theory.

Inputs

Inputs are items that are used by the various processes in the system to achieve the overall goal of the system. General types of inputs include, for example, people, money, equipment, facilities, supplies, people's ideas and people's time. For example, inputs to a service that provides training to customers might include trained teachers, students, training materials, classrooms, funding, and paper and pencils. Inputs can also be major forces that influence the organization and its products and services. For example, various laws and regulations influence how the product or service is provided. Inputs are often identified with the cost to obtain and use them. Simply put, a budget is a listing of the system's inputs and the costs (expenses) to obtain and use the inputs, along with any monies expected to be earned or raised (revenues) from the system's outputs.

Processes (Methods to Produce Results)

Processes, or activities, are series of activities conducted by the organization, product or service that manipulate the various inputs to achieve the overall desired goal of the organization, product or

service. For example, the major processes used by a service that provides training to customers might include recruitment of students, pre-testing, training, post-testing and certification. Processes can range from the simplicity of putting a piece of paper on a desk to the complexity of manufacturing a space shuttle. Leaders are usually concerned primarily with the most important recurring processes in the organization, for example, its plans, policies and procedures. Some people refer to the processes as the "activities," "methods" or "throughputs."

Outputs (Tangible Results)

Outputs are the tangible results produced by the organization, product or service. Outputs are often described by using numbers, for example, the number of students who finished a certain program. Outputs are often mistaken to indicate the success of an organization or one of its products or services. For example, leaders might mistakenly assume that because a program served a large number of customers, the program must have been quite successful. That is not a valid assumption. The success of a program or services is determined, not by the range and number of customers trained (that is, not by the outputs), but by how the well the customers benefited from that training (that is, from the outcomes of their participation).

Goals and Outcomes (Desired Results)

Goals are the ultimate results that the system wants to accomplish. All systems are goal-directed. For example, plants, animals and people strive to stay alive and to replicate themselves. Organizations and its subsystems must have clear goals, as well. That is why it is so important for leaders to establish goals and thoroughly communicate them throughout the organization.

The overall goals of an organization are usually described in terms of its mission, or purpose. In addition, many organizations often associate a vision, or clear depiction, of what the organizations or its customers will look like when working successfully at some point in the future. The mission, vision and strategic goals are usually determined during strategic planning. Thus, strategic planning is an important responsibility of the role of organization's leaders.

Note that an organization can have goals in a variety of dimensions, for example, goals regarding activities of the organization, activities of customers or impacts on customers (these impacts are often referred to as outcomes – see later on below).

Feedback

Feedback is continuously exchanged among the various parts of an organization and, ideally, with the environment external to the organization, as well. Feedback comes from a variety of sources, for example, from external stakeholders (customers, community leaders, investors), Board members, the Chief Executive Officer and other employees. Feedback can also come from evaluations of the organization, products, services and personnel. This ongoing feedback, or communication, is absolutely critical to the success of the organization. An organization has to continually include ongoing feedback within the organization and with its environment.

Assessment and Evaluation

Assessment means to make some measurement from the feedback. Evaluation means collecting information, or feedback, in an orderly manner and making judgments to make important decisions. An effective organization is continually collecting and assessing feedback to evaluate effectiveness in the organization. Often, assessment and evaluation are focused on various outputs, or measures,

from the system. Evaluation can be focused on the entire organization or any of its subsystems, for example, on administrative and management functions, products, services and personnel. Evaluation can be with regard to the quality of ongoing activities in the organization (formative evaluation) or the activities final results (summative evaluation).

Learning

Learning is enhanced knowledge, skills and attitudes that are gained to remain or become more effective in achieving desired results. Learning occurs within people and, ideally, within groups, processes and the organization itself. Learning often is the result of the assessment and evaluation of feedback in and around the organization. Learning is critical because it ensures that the organization is continually improving its understanding of itself and its environment.