In the previous chapter, we have seen how the self-organized global criticality of a business ecosystem generates local complexity for its composing parts such as firms, suppliers, and customers. It is one way in which complexity can arise. There are other ways, but the important question remains the same: how can these parts in such a complex environment cope with this complexity? Put another way, suppose the inputs to a firm show all sorts of variations: customer demands, prices of resources, share prices, competitors’ actions, government regulations, and so on. How can a firm respond in order to obtain or maintain certain desired outputs such as quality of products, quality of work life, profitability, social corporate responsibility, and a favorable public image? And, how serious is this environmental complexity really? Can we measure it to get a feel for its magnitude? Subsequently, how can managers take responsibility, and develop their ability to respond creatively to the complexity of environmental inputs, which are in principle unpredictable?

As any action-prone manager would ask, ‘Which actions will be most effective, and which not?’ It will turn out that the most important response is not so much some particular set of actions or activities. These, however, must still be worked through the constraints of the organizational structures and systems that managers have created. It is, therefore, rather the design and development of an effective organization that somehow has to absorb, what turns out to be, an almost unthinkable amount of complexity confronting any enterprise at any time. To understand this, we recall another principle which has been largely forgotten, but is extremely important to understand in times of increasing complexity. This is the Law of Requisite Variety (LRV) which
was discovered in 1956 by the influential British psychiatrist and pioneer cybernetician W. Ross Ashby (1903–72).

To briefly refresh your memory, cybernetics grew out of the interdisciplinary effort to master some serious wartime problems of control, such as tracking enemy airplanes to be able to shoot them out of the sky. Cybernetics was defined in 1948 by the mathematician Norbert Wiener (1894–1964) as the science of communication and control in the animal and the machine. A good description of the word cybernetics is steersmanship. The idea is that there are general principles of steersmanship in systems regardless of the stuff these systems are made of. Cybernetics was later absorbed by the more general systems science, which was a radical departure from the classical way of doing science. It should be of interest to any manager who desires to be a better steersman (in Greek, _kubernètes_).

Stafford Beer (1926–2002), who was a pioneer in applying cybernetics and especially the LRV to management, and a prolific writer on the subject, said in his earlier works that whereas cybernetics is the science of control, management is the profession of control. In his later works, getting closer to its core meaning, he referred to cybernetics as the science of effective organization, and to management as the profession of effective organization.

The timeless LRV is like Newton’s law of gravity. It can be argued that it is of equal importance, especially for managers, but as with the law of gravity you do not have to be aware of it or even know that it exists. You can be absolutely certain that when you drop an apple it will always fall to the ground. Similarly, there are situations in real life where the LRV clearly operates or is obviously violated, without us knowing it. We will give some examples, but let’s first discuss the key concept of _variety_ a little further. Variety is a measure of complexity and refers to the number of possible states of a system. At the same time, the measure of variety is also a measure of the uncertainty in a situation. Naturally, the more variety of states of a system, the higher the uncertainty as to which state will actually occur.

Let’s give some simple examples that can give us a good feel for what is involved. These evergreen examples are derived from the earlier works of Beer, particularly his prize-winning 1966 book _Decision and Control_. Consider a collection of three things or persons: A, B, and C. The variety of the collection equals three, expressed as $V = 3$. That’s all; there is nothing more to it. Now this collection of things is certainly not a system. For this we have at least to consider the relationships between the three things. We can distinguish three possible relations: $A-B$, $A-C$, and $B-C$. We may want to distinguish between the relation of $A$ to $B$,