

The process initiated by the preparation of a decision record (6) and terminated by a change of the system or its environment (10), is what makes it possible for management to learn and adapt rapidly and effectively.

Now let us consider how threats and opportunities can be identified. First we must identify symptoms and then synthesize them into a diagnosis. We normally use the term symptom to denote an indicator of a threat to the health of an organism or organization. However, it may also refer to an indicator of an opportunity. A symptom is one of a range of values of a variable that usually occurs when something is either exceptionally right or wrong, but seldom occurs when things are normal. An unusually high unit cost of production suggests that something is seriously wrong. An unusually low cost suggests that something is exceptionally right. On the other hand, either a low or a high body temperature suggests that something is wrong. A fever is seldom associated with good health.

The techniques of statistical quality control provide effective ways of defining *normal* and *abnormal* behavior.

Variables used as symptoms are properties of the behavior or performance of organisms and organizations. Such variables can also be used dynamically as *presymptoms* or *omens*: indicators of future threats or opportunities. For example, the range of normal body temperature is about one degree Fahrenheit. Suppose that in five consecutive readings of a person's temperature taken a half hour apart, a normal but rising temperature is observed. This would indicate that unless an intervention occurs the person observed will have a fever in the near future. The same would be true if we observed small but repeated increases in the number of defects coming off a production line.

A presymptom is *nonrandom normal behavior*. Nonrandomness can manifest itself in many different ways, the most familiar being trends or cycles. Such nonrandomness is usually easy to detect by statistical tests or even the naked eye.

A complete management system regularly obtains information on a number of *performance indicators* (11) some of whose values are symptoms. In many organizations this is a function of the controller; in a hospital it is the function of the nurses. Controllers and nurses usually obtain and examine a large number of performance indicators in search of symptoms and presymptoms. Therefore, the information subsystem should be responsible for obtaining and providing such observations. These should be supplied to the *symptom and presymptom analyzer* (G). When *symptoms and presymptoms* (12) are found, they should be sent to the diagnostic function. Once a diagnosis is obtained, the *threats or opportunities* detected (13) should be reported to the decision-making subsystem.