Consider the well-known notion of "food." Any object that the system views as a source of matter and energy (which could be consumed to support life) is considered by the system as food. It is not important if the system actually uses this object as food or not. In other words, there are objects in nature that could be perceived by a human being as food. On the other hand, the real food is only the objects that the human being actually consumes. Hence, when using the term "edible" objects (for a system), one usually means a potential food. The object becomes actual food only when it is eaten by the subject. For example, a rabbit could be considered potential food, but it becomes actual food for a wolf only after the wolf eats the rabbit.

The situation with information is analogous. From the accepted notion of information, any set of symbols that the system could use to extract information should be considered as an object carrying *potential information*. Remember that from the point of view of semiotics, the symbol is a representation that carries information for a system about an object, phenomenon, relationship, and so on. Given a set of symbols different systems could extract different actual information. In other words, a particular system can extract from potential information only that which it considers useful to remove uncertainty from a behavior algorithm; that is, it extracts *actual information*. Now that it is clear that actual information only exists as a specific need for a particular system, we can speak of its subjective character.

Because we are interested in satisfying the information need (with, as we now know, actual information), we now proceed with the discussion of the psychological state that is called information need.

2.3
The Information Need

The previous section showed that a physiological need, in the most general sense of the term, is the subject's need or requirement for something that will only be satisfied by some form of activity (such as lying down to rest or scratching an itch) or through some product (such as potable water or warm clothing). But whatever physiological need is satisfied, this is done only with the help of a behavior algorithm created on the basis of information. In other words, an information need precedes any activity and is an indispensable partner in satisfying any physiological need.

It is obvious that the subject of the need is an individual, which in the future will be called "the user." The user experiences a need as anxiety, stress, excitement, discomfort, or some other similar emotion. Of course, each of the named mental states has its nuances, but they all can be referred to as members of one class—the state of displeasure. Satisfaction of a need (process) yields a sense of relaxation, relief, or enjoyment. This class of mental sensations exem-

plify the state of pleasure. A similar polarization of mental states was noted comparatively long ago. By the middle of the 19th century, the German psychologist Fechner (1996) had already proposed a theory of pleasure and displeasure. He noted that insofar as conscious stimulation always relates to pleasure and displeasure, both pleasure and displeasure can be represented as having a psychophysical relation to stability conditions. This direction was further developed at the beginning of the 20th century in the theory of psychoanalysis created by the Austrian psychologist Freud (1961). He formulated the pleasure principles, the principles lying at the base of the subject's mental activity. However, the nature of these mental states were not investigated at the time. Authors considered pleasure and displeasure to result from not just something, but something given, a starting point, the origin of vital activity. They assumed the presence of the soul (a particular nonmaterial substance independent of the body) of which pleasure and displeasure are characteristic (a property of the soul). Freud, who was dissatisfied with this explanation (perhaps due to lack of information), wrote:

We would have been filled with gratitude for a philosophical or psychological theory that would have been able to explain to us the significance of how imperative the feelings of pleasure and displeasure are for us. Unfortunately, nothing is being suggested which is acceptable to us. This region is the darkest and most inaccessible region of mental life. (Freud, 1961)

It should be pointed out that long before information science came into existence as a separate field to deal explicitly or implicitly with the satisfaction of the IN, psychologists studied the IN, although not too intensively and without much success. With the development of the field of information science, interest in the study of the IN increased considerably. For example, the yearbook of the International Federation of Documentation (1973) pointed out that 144 works on IN study were published by 1967. Nevertheless, despite the fair number of studies, no essential results have been obtained, as was mentioned in the yearbook's preface:

IN studies have obviously not lived up to the expectations, because they only helped to discover what has already been known through the practice of publishing scientific and technical literature, as well as from the experience gained from library/ bibliographic work.

Some authors (Jahoda, 1966) even denied the value of IN study, whereas others (O'Connor, 1967, 1968) believed that it was impossible to determine what IN should mean. Moreover, since the mid-1970s, to a certain extent as a result of such beliefs, the number of publications that featured IN study has decreased dramatically. Nevertheless, the situation has proved to be not so gloomy. Several authors (see, for example, Allen, 1991; Bates, 1989; Belkin, 1987; Belkin & Croft, 1987; Fidel & Soergel, 1983; Lancaster, 1968; and Ingerwersen, 1994) introduced some interesting ideas that led to a better understanding of such a phenomenon as IN. This chapter is based on the approach developed by Voiskunskii & Frants (1974) and Frants & Brush (1988).