

ways "feel" which of them have meaning (i.e., the semantic component is present) and which do not (the semantic component is violated).

Because meaning is the prerogative of the human intellect, the use of the semantic component of a natural language may be performed only by people. Thus, speaking of "natural language," we mean, first of all, a system that has as one of its most important and *indispensable* properties: the presence of something that is perceived by humans as meaning. Moreover, all existing language components are present only to the extent to which they facilitate the transmission and perception of meaning. For this reason, when any manipulations are being performed or will be performed with the use of language components but not with its semantic component (in other words meaning will not be considered), we can say only that *the elements of a natural language, not the natural language itself*, are involved in a process.

In the previous examples of retrieval using a natural language, the content of the text is compared to the requirements of retrieval, and the person performing the retrieval first takes into account the meaning and selects only those documents that contain the required meaning. *It is exactly that type of retrieval (retrieval by meaning and selection by meaning) that is considered a retrieval using a natural language.* This is the viewpoint that we will use from now on.

The understanding of the natural language we have described is based more on the generally accepted intuitive perceptions than on formal definitions. First of all, we were led to this understanding by an analysis of a large number of definitions present in various dictionaries, encyclopedias, textbooks, and term definitions that are reasonable (in the sense that the authors use the generally accepted notions) but still not quite formal. Actually, they suggest that we consider as natural any language that a child first begins to master. However, there have been cases in which a child in an Esperanto family first began to speak Esperanto. Often a language that is capable of further development is considered the natural language. However, it is possible to name a number of artificial languages (Esperanto, for example) that developed with time. Other definitions known to us have their own inconsistencies.

A significant reason for using the previously mentioned "reasonable" approaches for the purpose of understanding the substance of a natural language included our own attempts to provide a strict definition of the natural, as well as the artificial, language. In doing so, we analyzed the language from different viewpoints. For example, we attempted to trace the origins of a language. Thus, in various religious books, myths, and legends of most peoples, the language is assumed to have a divine origin. Consider the Bible story of the Tower of Babel and the involvement of such gods as Mercury of the Romans, Tot of the Egyptians, Nabu of the Babylonians, Tsen Tze of the Chinese, Brahma of the Hindu, and a great many others. As a result, out of all our attempts to provide a definition, the strictest one turned out to be the following: a natural language is any language having a divine origin. As a counterpart to that definition, it has

been proposed that any language created by man be considered an artificial language. Since scientists are never too serious (none of our colleagues took this definition seriously), we have rejected the use of this definition also.

Thus, in summarizing we emphasize that a retrieval using a natural language is a comparison and selection on the basis of the semantic component of a natural language (with the use of the meaning) and that this retrieval is performed only by humans. Thus, in answering the questions posed earlier, it may be asserted that with the help of each of reviewed methods of retrieval, the retrieval itself was performed using a natural language. Then why should the artificial IRL be created? The fact is that the crisis in information retrieval occurred precisely because practically all utilized methods of retrieval through the middle of the 20th century anticipated that the retrieval would be performed by humans. But the increase in the amount of information in a search process was too overwhelming for a manual processing, which forced a move away from a search "by meaning," that is, from a retrieval using a natural language. This required the use of artificial languages whose semantic component is not intended for typical intellectual activity. In connection with this fact, we will discuss in some detail why a search performed by humans hinders the satisfaction of the human's IN.

The ideas of the compression of texts and collections (used in search processes for thousands of years), which always assumed a manual review of the "compressed," in some sense reached a dead end. With an explosion in the amount of information available in this century, even compressed collections are too large to be reviewed manually. Also for the first time, the researchers noticed that the speed with which a person reviews collections of documents is limited by the person's physical characteristics, and this speed has not changed over time. This observation led to the idea of speeding up the search by replacing humans with some device capable of performing searches at qualitatively different speeds. As the result, today computers play the role of such a device. In other words, for the first time in the history of information retrieval through IR systems the idea of speeding up the process of reviewing the information collected was considered. This replacement of a human by a device (a computer) resulted in many new problems related to the organization of searches in artificial languages.

Artificial languages for the purpose of retrieval appeared a long time ago. Thus, as the idea of compressing collections of information, developed, that is, the desire to review only a portion of the collection and the wish to make retrieval subject-based (theme-based), the ideas of classification were introduced. Library classifications with their own specially created specific languages appeared. Apparently, these languages (which are often called classification languages) became the first IRL that differed from the natural ones. Very little data on the classifications utilized in ancient libraries exist today. However, these classifications were developed in a rather detailed way in ancient times. This