

then the result of the search based on the first search request is better than the result of the search for the second search request. However, in our opinion, the result of the first search (for the first request) is substantially worse than the result of the second search (for the second request).

Such examples led us to the conclusion that it is not expedient to use complex search characteristics  $I_{13}$  without providing additional arguments. Therefore, for constructing CSCs in the case of vectors  $W$  and  $V$  from the functions described earlier, only  $\rho(X, Y)$  and  $\rho_1(X, Y)$  could be used. Applying these functions to vectors  $W$  and  $V$  we obtain the following complex search characteristics:

$$I_{14} = \rho(W, V) = \sum_{i=1}^{N_0} |w_i - v_i|;$$

$$I_{15} = \rho_1(W, V) = \sqrt{\sum_{i=1}^{N_0} (w_i - v_i)^2}.$$

Note that these complex search characteristics could be paired with previous CSCs  $I_{14}$  and  $I_3$ , and also  $I_{15}$  and  $I_4$ , where both characteristics in each pair are based on the same function.

As stated earlier, from our point of view, it may be expedient to use complex search characteristics  $I_{14}$  and  $I_{15}$  for the functional efficiency evaluation in the discussed situation. In this respect it is only natural to ask this question: How well founded is this assumption? It is clear that the answer to this question will follow if we find an answer to the following question: Do complex search characteristics  $I_{14}$  and  $I_{15}$  permit the evaluation of functional efficiency (in the discussed situation) that is pragmatically justified, and if they do, then in what cases? It should be emphasized here that today we can only outline problems associated with the latter question, rather than propose their solution. Let us consider some of these problems.

1. In order to determine in which cases complex search characteristics  $I_{14}$  and  $I_{15}$  permit the pragmatically justified evaluation of functional efficiency and in which cases they do not, we first must have a clear understanding of the position from which functional efficiency is evaluated. However, at present we have no understanding of such a position and, as was stated before, are not ready to define a set of consistent criteria for functional efficiency evaluation that will give us the required understanding.
2. Obtaining an understanding of the position from which functional efficiency is evaluated is a necessary step, but it is not a sufficient one. In particular, it is not clear if we can find a method that will not require functional efficiency evaluation in order to find an answer to the question: Will the complex search characteristic  $I_{14}$  ( $I_{15}$ ) permit

us in the discussed (arbitrary) case of document search to perform a pragmatically justified evaluation of functional efficiency? Note that to find an answer to a similar question regarding a number of CSCs considered before, such a method had been found (see Section 10.4, "Limits of Applicability of Complex Search Characteristics").

Naturally, the considered problems do not represent all problems associated with finding the answer to the following question: In what cases do complex search characteristics  $I_{14}$  and  $I_{15}$  permit (and when don't they permit) one to perform pragmatically justified functional efficiency evaluation? However, we will not consider any additional problems because we have not solved the previous problems. It follows from the preceding that we are not ready to make a decision as to expediency of using characteristics  $I_{14}$  and  $I_{15}$  for functional efficiency evaluation. By the way, it is conceivable that to make such a decision an additional conceptual apparatus will be needed (similar to what we have used in Section 10.4, "Limits of Applicability of Complex Search Characteristics").

Thus, for the present we cannot find a definite answer to the question of whether it is expedient to use characteristics  $I_{14}$  and  $I_{15}$  for functional efficiency evaluation (in the discussed situation); on the other hand, we can provide an answer to another question that is very important from the practical point of view: Do these CSCs have the order preservation property? Before answering this question, first note that in the discussed situation it is more convenient to use an essentially similar, but more pragmatically clear, formulation of the order preservation property. In order to state the required formulation, let us assume that we have a number of arbitrary search methods. Assuming that all these methods have been used in a search on the same query in the same search collection  $D$  and that this search resulted in outputs  $h_1, h_2, \dots, h_{i_1}, \dots$ , let us designate a union of the resulting outputs by  $h$ , that is,  $h = \bigcup_i h_i$ . (It is clear that  $h$  is a subset of  $D$ , and let us assume that set  $D$  contains  $N_0$  documents and subset  $h$  contains  $p$  documents.) Further, note that values of search characteristics and parameters can be determined both from the results of search and analysis in collection  $D$  and from the results of search and analysis in subcollection  $h$ . To distinguish these situations, we will use the symbols  $\wedge$  and  $\sim$ ; namely, symbol  $\wedge$  will be used for marking search characteristics and parameters in a situation where their values are determined from the results of search and analysis in collection  $D$  (for example,  $\hat{F}$ ), and symbol  $\sim$  will be used for marking the same search characteristics and parameters in a situation where their values are determined from the results of search and analysis in subcollection  $h$  (for example,  $\tilde{F}$ ). Now, let us assume that as a result of using each of these search methods, values of a certain complex search characteristic  $F$  (both  $\hat{F}$  and  $\tilde{F}$ ) have been determined. Then the required formulation of the order preservation property will be as follows.

If in the case of any two used search methods,  $(i_1\text{-th and } i_2\text{-th})$ , the signs