DEVELOPING A MODEL OF HUMAN INTERACTION WITH THE SYSTEM OF DECISION-SUPPORT IN DOCUMENT MANAGEMENT

Arseniy Bakanov

***Abstract**: Article focuses on issues related to human interaction with the intelligent information environment. The process of such interaction can be represented as a sequence of elementary action on receiving information, analyzing it, and then make a decision. During such interactions, subject has to consider a lot of different factors, and solve problems multicriteria choice. The presence of complex, multi-criteria task forces a person to use a variety of heuristics for solving the problem. As part of the research, of great scientific interest to develop a model human interaction with intelligent information environment, with the use of which may carry out modeling and predicting user behavior.*

***Keywords**: intelligent information environment, decision making, document management.*

***ACM Classification Keywords**: H.4.2 Types of Systems - Decision support*

Information technologies and decision support system

There are many people understand Information technology (IT) like technology for the application of computers and telecommunications equipment to store, retrieve, transmit and manipulate data, often in the context of a business or other enterprise (wikipedia). The term is commonly used as a synonym for computers and computer networks, but it also encompasses other information distribution technologies such as television and telephones. But this term is somewhat broader and imply any technologies for store, retrieve, transmit and manipulate data.

At every stage of civilization, mankind use different information technologies processing from papyrus to e-books. And any of these technologies used by humanity for store, retrieve, transmit and manipulate data and therefore any of these technologies has to be called information technology for particular stage of civilization.

With the advent of intelligent systems, has changed information technology. But more intelligent systems have changed the human environment. We assume that the presence in the environment some intelligent agent makes environment intelligent. Under the term intelligent agent, we understand some software (hardware-firmware) module, which performs monitoring of the environment, learning and acting in the environment, with rational behavior in sense that its actions are always directed toward a specific purpose. Relevance of the study model of human interaction with the intellectual environment due to the importance of the role played by Intelligent information environment in a life of each person, and the impact that it made on human life, regardless, involve he in a direct interaction with Intelligent information environment or not.

Model human interaction with system of decision support

During the interaction with intelligent information environment, a person has to consider a significant number of factors, and resolve problems multicriteria selection. Multicriteria problems are a particularly complex class of problems [Петровский, 2004] for the human system information processing. Availability many criteria lead to the load on the human system information processing, forcing people to use a different, often original heuristics to solve the task [Ларичев, 1987].

Human by different channels (using different telecommunication devices) recieved significant amounts of information for processing and subsequent decision. Influence of information on human performance factors, including decision-making processes are reflected in the works of V. Bodrov, V. Venda, B. Velichkovsky, B. Lomov, A. Baddeley, R. Hockey, E. Hubbard, D. Salvendy, C. Wickens, etc. Among the research on issues information exchange should be noted work of the collective of authors: T. Atanasova and others, in which human interaction with the environment intelligent habitat explains by the psychological mechanisms [Атанасова и др, 2010]. From the standpoint of cognitive psychology, human capabilities for receiving and processing the information, described by different functional models of memory structure [Baddeley, 2009; Величковский, 2006].

In accordance with the purpose of the work was carried out experimental the study of human interaction with intellectual information environment. Human interaction with intellectual information environment was considered by example interaction with system document management with decision support system. In the studies simulated work decision makers (DM). The work was to reading the document - the reading of the text which the presented on the monitor computer, and then making a decision about sorting (decision making), that is, the determination of the department or division of the organization, where're the document should be sent for further processing.

Presentation of documents was carried out with the use of electronic document management system "CDS" [Баканова, 2007]. The structure of this electronic document management system was included software module that implements the functions of the system decision support. This module perform pre-processing the document text. The pre-processing aim was to determine the structure of the text and implementation of content analysis using a specially developed vocabulary (thesaurus). The aim of pre-processing to visualize the structure of text, and highlighted in color the supporting words [Баканов, 2009]. Sequence presentation of text (with the supporting words and no supporting words) on the computer monitor changed for purpose eliminate addictive. After reading the text, the subject makes a decision.

The studies were conducted using equipment tracking the trajectory of the user's eyes (www.smivision.com) in the process read the information and process decision-making. At the stage of the decision making were presented (on the monitor) two types of questions. Questions of the first type detected the structure of mental representations. The questions were presents in the next order:

1) Select the alternatives from the list to which this document / text refers.
2) Select the alternatives (of the earlier ones) to which this document / text refers to the greatest extent.
3) Choose only one alternative (from selected earlier).

Thus, in the process of answering the questions of the first type was revealed the structure of mental representations by, formed after reading particular document / text, see Figure 1. Questions of the second type (also demonstrated in the monitor) determined quantify the extent to which the document / text refers to the selected alternative. The trajectory of the gaze of the subject in the decision making process was fixed by the experimenter.

In parallel with the experiments, conducted studies of cognitive style impulsive / reflective, fielddependance / fieldindependance etc. [Холодная, 2002], as well as the style of self-regulation of behavior by method Morosanova [Моросанова, Индина, 2011].

The purpose of the experiments to study the process decision-making in the problem of sorting a document is its formalization as a model.

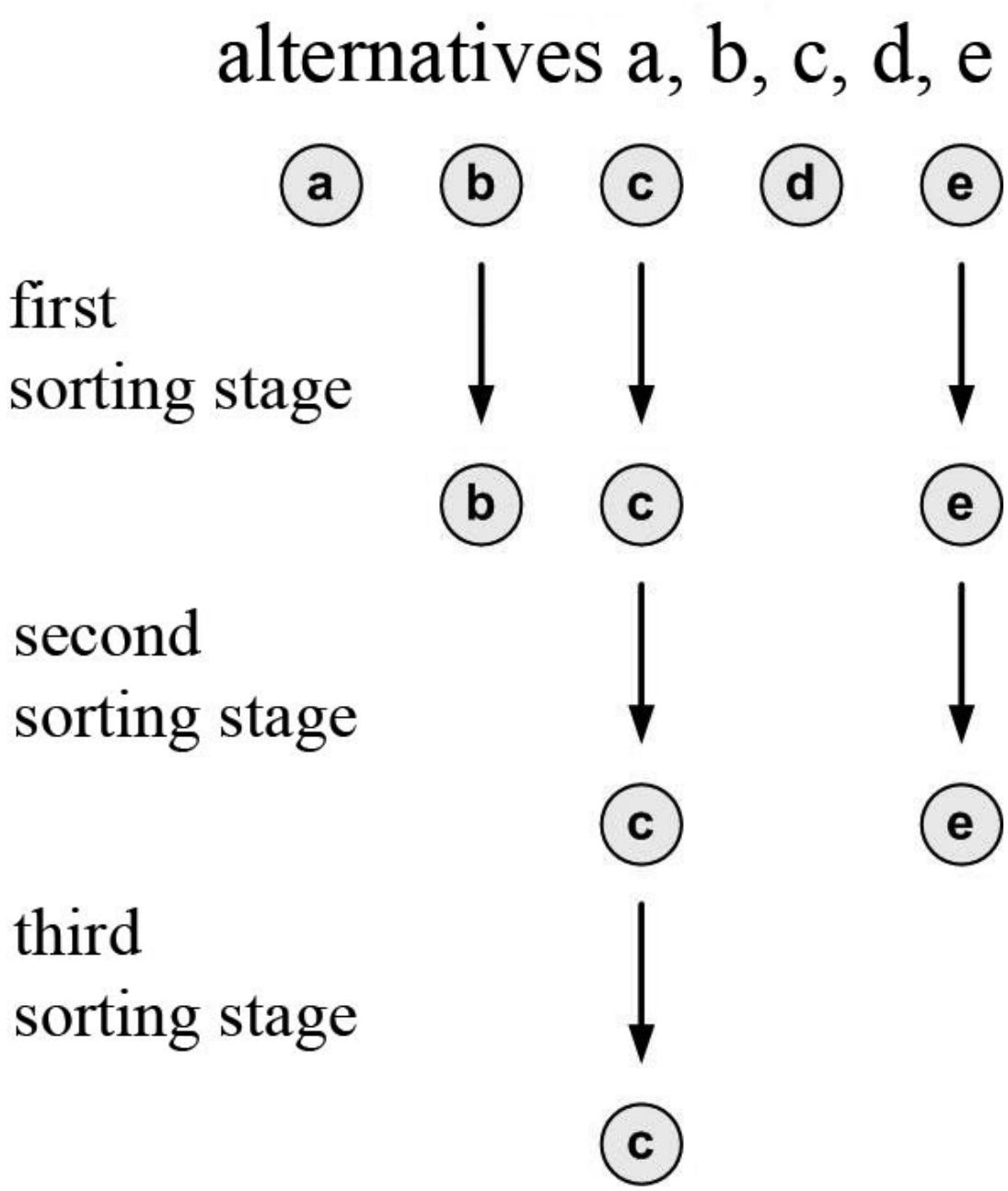

Figure 1.

Results of the study and conclusions

As a result of the research was developed model describing with sufficient accuracy by human interaction with the system of decision-making. The model based on the assumption that the user's ability to receive, transmission and processing of information are at any given time varying, but limited resources. The process of human-computer interaction is considered as a closed system that can move from one state to another. To develop a model of human interaction with intelligent environment (decision support system) used mathematical apparatus information theory and game theory.

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Authors' Information

Bakanov Arseniy *– Institute of Psychology, Russian Academy of Sciences, Yaroslavskaya st.13, Moscow, 129366, Russia; e-mail: arsb2000@pochta.ru*

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