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DETERMINATION OF THE PRIORITY OF R&D PROJECTS USING A CRITERIA SCALING ALGORITHM

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Determining the priority of R&D projects is one of the main problems in scientific activity organization on a competitive basis. The aim of this paper is to develop a method for multicriteria evaluation and ranking of R&D projects. The paper uses methods of decision-making theory, multi-attribute value theory, and verbal analysis. The familiar independent-scaling algorithm, which is based on the value dichotomy method, is analyzed. As a result, procedures for criteria co-scaling and determining preference midpoints on their given variation intervals are refined. A procedure is proposed for extrapolating stable superiority relations to facilitate a search for preference midpoints in situations where the decision maker has difficulties in fixing equivalence relations. Algorithms for constructing local value functions for quantitative and qualitative criteria are presented. A method is proposed for constructing an integral criterion for the value of alternatives in normalized additive form. The method allows one to find the values of local value functions for qualitative criteria from function graphs built for quantitative criteria. The values of discrete value functions and the normalizing factors are determined from a system of algebraic equations, which is a mapping of the system of equal preferences of the decision maker. The proposed method is illustrated by calculating the priority of R&D projects. Unlike the independent-scaling algorithm, which can be used only for quantitative criteria, the proposed method allows one to rank alternatives in the space of quantitative and qualitative criteria with a resolution equal to one. The results reported in this paper may be used in calls for projects and in the formation of R&D programs in the space industry.

Keywords: *projects, evaluation, ranking, quantitative and qualitative criteria, local value function, integral criterion.*

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