

Fuzzy Multi-Criteria Model for the Formation of an Optimal Project Portfolio in the Sphere of the Organization's Human Capital Development²

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Abstract

Nowadays human capital is becoming one of the basic factor of company's success, and more or less influences on its social-economic development, which is basis on successfully implementation of strategic development program. Strategy formalization in the form of goals, tasks, and scenario contains target values of key indicators. The achievement of these values is influenced in high degree by company's level of human capital and system of its development. The system consists of package of measures concerning getting knowledge acquisition, skills and experience of professional activity, filling up amenities of life and funds of employee, taking measures promotive of good health of the person and promotion of his reputation on the territory (region, country and all over the world). In this regard, it is necessary to develop an instrumental component of the theory of human capital, which allows us to quantify the impact of the level of human capital and its dynamics on the degree of progress in achieving the target values of the organization's strategic roles. In recent years, the authors have developed a number of methods and models of the theory, including a one-criteria model that allows to form the optimal structure of investment distribution in the organization's human capital depending on the initial parameters and strategic roles of its business-units. The reduction of multifaceted strategic roles into a single objective function leads to the fact that its largest extremum can be achieved by overfulfilling some strategic roles, in spite of a significant non-fulfillment of others. The paper proposes a multicriteria model with several objective functions, each of which corresponds to strategic roles attributed a single strategic goal. The model is a vectorial topic of mathematical programming with non-uniform criteria, which is solved numerically. As a result of the solution of the model, there is an optimal project portfolio. At the same time, closing the gap between the "real world picture" and the "idealization" of the model makes it possible to take into account the uncertainties that arise, including when estimating human capital at the initial time, by using the mathematical apparatus of the theory of fuzzy sets.

Keywords: Human Capital, Mathematical Modelling in Economics, Multicriteria Model, Optimization, Project Portfolio, Strategic Management, Fuzzy Approach

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