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EVALUATION CRITERIA OF INNOVATIVE SOCIAL INVESTMENT PROJECTS IN HEALTH CARE

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Purpose: analysis of key indicators and creation of evaluation criteria of innovative socio-economic investment projects in healthcare, implemented on the basis of public-private partnerships.

Methodology: there has been performed comprehensive assessment of specialized socio-economic projects in health sector taking into consideration interests of participants in the project (public and private), main aspects (medical, social, economic, scientific and innovative), and assessment components (presumable effectiveness or risk during implementation) of the project. The degree of relative importance of the factors considered in each level, and the levels themselves are determined by experts with the help of paired comparisons method. The values of the project indicators are estimated against nonuniform grading scale, both the results of direct measurements and expert information being used.

Results: There has been suggested an approach and a procedure for evaluating projects based on the allocation of interests, issues and evaluation components of the project as sub-criteria levels of the hierarchy analysis method; there has been developed research prototype of information analysis system for assessment of projects on the basis of the proposed approach.

Keywords: investment projects, innovation projects, evaluation criteria, public-private partnership, healthcare.

КРИТЕРИИ ОЦЕНКИ СОЦИАЛЬНЫХ ИНВЕСТИЦИОННЫХ ИННОВАЦИОННЫХ ПРОЕКТОВ В СФЕРЕ ЗДРАВООХРАНЕНИЯ

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Цель: анализ основных показателей и разработка критериев оценки социально-экономических инвестиционных инновационных проектов в сфере здравоохранения, реализуемых на основе частно-государственного партнерства.

Метод проведения работы: использовалось комплексное оценивание специализированных социально-экономических проектов в сфере здравоохранения с учетом интересов участников проекта (государственный и частный), основных аспектов (медицинский, социальный, экономический и научно-инновационный), а также оценочных компонентов (предполагаемой эффективности или риску при реализации) проекта. Степени относительной значимости факторов, учитываемых в рамках каждого уровня, и самих уровней определяются экспертами на основе метода парных сравнений. Значения индикаторов проектов оцениваются в неравномерной бальной шкале с использованием, как результатов непосредственных измерений, так и экспертной информации.

Результаты: предложен подход и разработана процедура оценивания проектов, основанные на выделении интересов, аспектов и оценочных компонентов проекта в качестве уровней субкритериев метода анализа иерархий; разработан исследовательский прототип информационно-аналитической системы оценки проектов на основе предложенного подхода.

Ключевые слова: инвестиционные проекты, инновационные проекты, критерии оценки, частно-государственное партнерство, здравоохранение.

Nowadays, health care projects implemented by public private partnerships, where the goals of state and those of business partially overlap (profit taking,

increasing efficiency of business activity, increasing availability of human resources, reducing welfare payments) are becoming increasingly popular. [3].

Any mechanisms of cooperation between the state and private enterprises (which vary depending on the amount of ownership authority, investment responsibility of parties, risk sharing principles and responsibility for performing various kinds of work, etc. transferred to the private partner) presuppose participation of state authorities (federal, regional, municipal) in the funding of the project.

Thus, it is necessary to perform multi-criteria assessment of the projects which would allow choosing not only economically most efficient projects, but socially significant ones as well, to include them into socio-economic programme with state co-funding. Therefore, developing assessment criteria and scientific grounding of social investment projects in the field of health care is acute. Unlike purely economic projects social projects are aimed at enhancing the role of the human and development of the person and the humanity.

The goal of the study is to analyze basic indicators and develop criteria for assessing socio-economic innovative investment projects in health care.

Procedure of Assessment of Innovative Socio-Economic Investment Projects in Health Care

The procedure of assessment of investment projects in health care includes the stages typical for such kind of procedures as applied to socio-economic projects [6,7], but with certain specifics of projects related to health care. They are:

1. Collection of project data including not only information provided by the participants of bidding, but independent opinion survey among the population and health care professionals, conducted with the help of Internet technologies [2, 5].
2. Creating information model of the project that is defining a battery of its

necessary characteristics, setting variation intervals and their values and developing a form of presentation of this data aggregate.

3. Developing assessment criteria of the project and choosing assessment method with consideration of the constructed information model.
4. Checking adequacy of the models and methods on test projects, where estimation results are known in advance. In case of unsatisfactory result of the check it is necessary to return to one of the previous stages and go through it again having made the necessary alterations.
5. Estimating the project in question against the developed criteria using the chosen methods.
6. At every stage specific characteristics of the type of project in question can be seen. As a rule, an investment project has primarily economic tasks. However, projects in the field of health care possess certain peculiarities, the most important of which is the social significance of the project.

Hierarchy of Criteria of Assessment of Projects

Complex assessment of specialized socio-economic projects has to take into consideration interests (goals) of all the parties concerned. Diversity of criteria, that arise from these goals can be easily classified in relation to the participants of the public-private partnership: state (*Gov*) or private (*Pr*), and also depending on medical (*Med*), social (*Soc*), economic (*Ec*) scientific and innovative (*Innov*) components of the project (to consider social specifics of innovative projects in health care it is necessary to single out medical, scientific and innovative aspects of a social project). Another classification indicator is the compliance of the criterion with the efficiency of the project during its implementation (*Ef*) or the loss that may occur in case of possible improper implementation of the project (*Risk*). For example, according to the classification criterion *CritGovEcRisk* reflects:

- public interests in case of implementation of the project (*Gov*);
- economic component of the project (*Ec*);
- risks in case of implementation of the project (*Risk*).

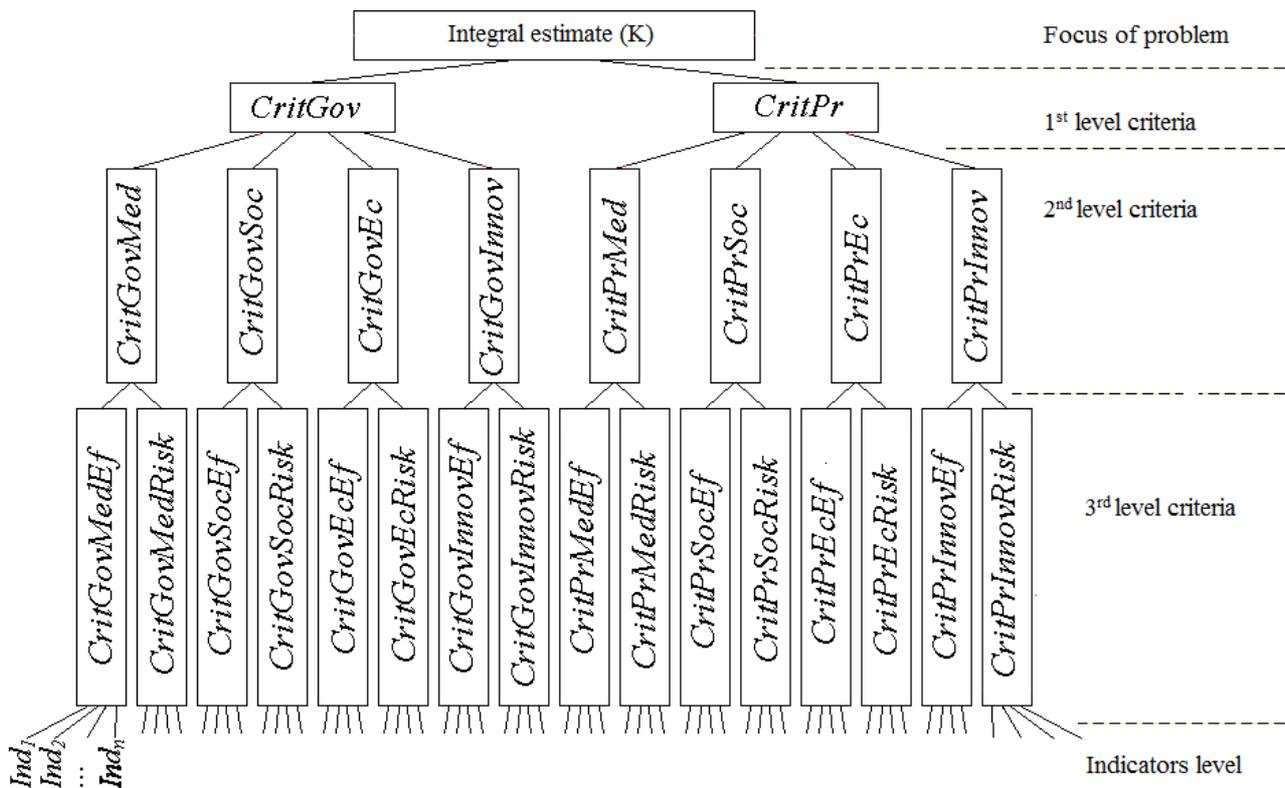
Each of the considered criteria corresponds to its group of indicators, which are provided in nondimensional form (in grades) and represent characteristics of the project. For calculating indicators, which characterize the project on the private side (*IndPr*), the following formulas are used: $IndPr = N \cdot \text{abs}(X - X_{Stand}) / X_{Stand}$ where X is the value of the characteristic of the project, X_{Stand} – reference (maximum or minimal depending on the idea behind the characteristic reflected) value of the characteristic, N - maximum possible value of the indicator corresponding to the overlap between the value of the characteristic of the project and reference value.

Indicators, which characterize the project on the side of the state (*IndGov*) are connected with the impact of the project on socio-economic development of the country (region, municipality) and, as a rule, cannot be provided on the basis of quantitative characteristics only. Thus, expert technologies, for example, those based on analogies of Saaty scale, reflecting the concordance between qualitative and quantitative values of characteristics, could be used.

Subsequently, for transfer from numeric value of characteristic X to the value of *IndGov* indicator formula: $IndGov = N \cdot X / 9$ can be used.

Classifying properties of the criteria (*Gov-Pr*; *Med-Soc-Ec-Innov*; *Ef-Risk*) can be ranged depending on their importance, which could lead to various hierarchic constructions within the framework of hierarchy analysis technique.

Existing $3! = 6$ techniques of structuring reflect the peculiarity of the task and expert preference. Let us consider the method of structuring, which corresponds to the diagram of hierarchy analysis technique provided in Pic.1



Pic. 1. Diagram of hierarchy analysis technique for assessment of innovative projects in health care.

In the case given estimation of the project is made on the basis of the ratios, which include:

- formula for calculating integral grade (problem focus) as linear convolution of two 1st level criteria;
- formulas for calculating two 1st level criteria as linear convolutions of four 2nd level criteria each;
- formulas for calculating eight 2nd level criteria as linear convolutions of two 3rd level criteria each;
- formulas for calculating sixteen 3rd level criteria as linear convolution of four 2nd level criteria each;

Weighting coefficients, which are part of linear convolution, have to conform with the requirements of non-negativity and normalization. To calculate these coefficients expert estimation techniques (for example, group ranking technique and

paired comparison method) can be used [4].

The procedure of complex assessment of projects in the field of health care presented in the paper, based on application of multi-level hierarchy of criteria allows considering public and private interests, as well as certain components of the project (social, medical, economic, scientific and innovative), and their estimated effectiveness and risks and thus can increase feasibility of managerial decisions. Preliminary results of applying of this procedure (within the framework of research prototype of information analysis system of project assessment) prove the effectiveness of suggested approach.

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