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Taxonomy of the project portfolio risks - an empirical investigation

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Abstract

This paper focuses on project portfolio risk categorisation. Based on literature, a list including risks characteristic for a project portfolio was developed. After the assessment procedure (using the Delphi method), when the expert consensus had been achieved, thirty-six project portfolio risks were selected. The applied research procedure assumed project portfolio risk assessment, according to the approach suggested in the literature of the subject, including the likelihood of a given risk. During the research work, for the data clustering, exploratory factor analysis (EFA) has been applied. As a result of the analysis, a taxonomy of project portfolio risks was developed and a risk category with the greatest likelihood of occurrence was indicated.

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Keywords: portfolio risk likelihood, portfolio risk categorisation, factor analysis

1. Introduction

As opposed to single project risk management, the handling of risk at the level of project portfolios is a

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relatively new topic [34]. Literature indicates the traditional, single project-oriented risk management in the context of multi-project environment is insufficient [28]. The nature of the environment is such that when initiating new projects, organisations combine them into sets to enhance their flexibility [1, 29, 39]. Based on Markowitz's work [24], we can define a portfolio as a set of projects which can be managed together to maximize their expected value while maintaining an assumed risk level [38, p. 97; 40]. The studied literature on the subject indicates that portfolio risk management is a much more extensive area than the management of single project risks [31] and as such requires a comprehensive approach [29, 22]. This is due to the appearance of new types of risks arising from new interactions and correlations between portfolio elements [35, p.85]. The identification of risks arising from projects carried out as part of a portfolio can be performed simultaneously, which has a positive impact on the effectiveness of this task [44, 41]. The literature tackling the issue of effectiveness of portfolio risk management points to the significant investments made in this area and to the focus on results [21]. Adequate management of project portfolio risks helps to minimise the likelihood of errors and failures and, as a result, contributes to the success of a portfolio [12, 26, 43]. On a personal level, risk management requires that the person responsible for managing a portfolio assumes a comprehensive approach to prevent problems with portfolio risk monitoring [28]. Thus, portfolio managers must have unique competences that will allow them to shape the desired behaviour of members of their parent organisation [6, 18, 4].

Based on the literature studies, two related research questions have been developed: (RQ_1) is it possible to categorise project portfolio risks based on the likelihood of their occurrence? and (RQ_2) which of the established risk categories includes risks with the highest likelihood of occurrence? The answer to these two questions may help to improve the methods of diversification of project portfolio risks and, as a result, increase the likelihood of success at the organisational level.

2. Research results

2.1. Literature study and risk identification

The studies of the literature on the subject facilitated the selection and identification of risks specific to a project portfolio [14, 32, 10, 33, 9, 13, 20, 2, 12, 25, 6, 8, 28, 37, 5, 27, 29, 38, 30, 26, 18, 44, 4, 43]. All of the risks identified based on the literature on the subject were classified into one of three categories suggested in the literature (component, structural and general risk) [35]. The identified risks were evaluated by experts in accordance with the Delphi method [23, 45, 15].

Table. 1. Project portfolio risk list (names without descriptions)

Component risk	Structural risk	Overall risk
1.1 Significant changes in the project or program environment	2.1 Too large portfolio from the point of view of the portfolio executors' capacity	3.1 Lack of transfer of information and knowledge among the portfolio elements
1.2 Change in an approach of key project or program stakeholders	2.2 Significant portfolio fragmentation	3.2 Improper control over life cycles of projects and programs
1.3 Significant change in the basic parameters of particular portfolio elements	2.3 Overly complicated hierarchical structure of portfolio management	3.3 Unavailability of resources necessary to execute works within the portfolio
1.4 Improperly defined priorities for particular portfolio elements	2.4 Significant portfolio homogeneousness	3.4 Lack of coordination of the involvement of key resources in the execution of the portfolio
1.5 Disturbances of information flow and communication within the portfolio elements	2.5 Portfolio diversity range too wide from the point of view of portfolio executors' applied capacity	3.5 Relationships among products created by the portfolio elements
1.6 Ignoring risks by portfolio element managers	2.6 Mismatch between the portfolio structure and the parent organisation's strategy	3.6 Problems with access to the portfolio financing capital
1.7 Lack of developed methodical standards within the scope of portfolio element management	2.7 Improper portfolio balance	3.7 Possibility of the lack of financial liquidity within the portfolio
1.8 Improperly operating Steering Committees of projects, project groups and programs		3.8 Portfolio financing collapse
1.9 Conflicts between project and program managers within the portfolio		3.9 Non-compliance of a key element strategy with the portfolio's strategy
1.10 Conflicts between portfolio element managers and the parent organisation's decision-makers		3.10 Conflicts among objectives of projects and programs executed within the portfolio
1.11 Improper competencies of project and program managers		3.11 Conflicts between portfolio managers and portfolio element managers
1.12 Risks arising from the application of innovative technical and material solutions in the portfolio elements		3.12 Lack of involvement of top-level and middle-level managers in portfolio execution
		3.13 Lack of appropriate competencies of the portfolio manager and of the portfolio support structures