

Efficient Project Portfolio as a Tool for Enterprise Risk Management

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Abstract

Risks of different types are embedded into every business process and every business activity no matter what the business of the organization. At the same time, today all organizations seeking sustainable growth simultaneously manage a number of projects: endeavors that are even riskier than their usual daily routine. Examples are projects for the development of a new product or service, investment activities, implementation of an information system, entering a new market, re-branding and many others. All projects of an organization constitute a project portfolio.

Since projects are realized within one organization, they are subject to all types of risks that the organization has. At the same time, each project has its own risks that appear from the project's scope and uncertainties.

The project portfolio captures all the risks that the organization is subject to, along with the risks of the projects. These risks interact with and influence each other, and have a strong impact on the project portfolio realization and the organization's overall business performance. That is why a tool for managing project portfolio risks should be an indispensable part of an enterprise risk management system.

A tool for managing an organization's project portfolio risks is introduced in this paper. This tool is based on the approaches of H. Markowitz Portfolio Theory with the main idea of the organization's portfolio risk diversification. The H. Markowitz theory was developed to help an investor build an efficient investment portfolio (portfolio of securities). However today we would hardly find an organization that invests only in the equity market. Organizations invest in securities and at the same time invest in projects of different types.

In the report we introduce a generalization of H. Markowitz theory and apply it to project portfolios (that could contain investments in securities). The idea remains the same: we suggest that analyzing the profitability (utility) and risks of every project in the portfolio is important but insufficient; the correlations of the project's risks and the influence that the project has on risks of other projects and project portfolio should be considered in order to build an efficient project portfolio.

An efficient project portfolio term is introduced in the presentation. The term means a project portfolio that is built in order to achieve the organization's strategic goals with **minimal risks** under the conditions of limited resources.

We also consider a mathematical model for building an efficient project portfolio along with an algorithm based on the model.

In order to create the model, we have to consider a number of tasks that are described in the paper. We present the formalization of the characteristics of a project and specify the differences between project portfolio and portfolio of securities. That makes it clear that the differences between defining and formalizing risks of a security and risks of a project are substantial. A new approach for defining a project risk should be offered. The description of this approach follows; a way to determine a project portfolio risk is also presented.

Based on this approach to quantifying the risks of the projects, we offer a new concept of the interference of projects within a portfolio. The interference can be determined through the creation of a risk matrix of a simultaneous realization of projects.

The description of the model for building an efficient project portfolio, based on Markowitz theory, completes the theoretical part of the presentation. Then the algorithm is introduced along with the results of its approbation in one of Russia's financial institutions.

We believe that the approach described in the paper could help organizations build balanced and efficient project portfolios, thus minimizing the risks. That, in turn, is a necessary condition for achieving strategic objectives and sustainable growth.