Abstract

One of the most relevant questions in any industry to decide which project to build, to program or to perform. The market is full of options tailored to the capability of organizations, choosing the right project is a vital element of their way to success of failure. It is behind the debate that the process of constructing or programming any deliverable right is important, but the stepping stone to managing them must be outlined. The novelty of the paper is an integrated project prioritization model, which includes both financial and non-financial criteria. The conceptual idea is to integrate the financial element with the most widely used non-financial points of view that are already applied, tested and published in the relevant literature separately.

Keywords: project prioritization; project selection; project ranking criteria

1. Introduction

The ubiquitous project portfolio approach has a significant impact on modern organizations. Handling the fast growing number of projects has become one of the most important tools for achieving organizations’ strategic goals, and as Olsson (2008) and Teller and Kock (2012) argue, in a project portfolio environment the practice of single project management (SPM) has been increasingly loosing sufficiency, while project portfolio management (PPM) is recognized as one of the most crucial challenges of organizations. In our article, we use the definition based on the approaches of Archer and Ghasemzadeh (1999) and Martinsuo and Lehtonen (2007) to project portfolio. In this term the portfolio is a group of rival projects striving for sparse resources carried out under a single sponsorship and management of an organization in line with the strategy. Recently, the portfolio-wide perspective of project portfolio management goes well behind single project management that focuses only the processes of one project, and ignores synergistic effects with the others.

Project portfolio management is about managing multiple projects, programs, sub-portfolios, and operations as a group to achieve strategic objectives (PMI, 2013). The first step of PPM is project portfolio selection (adding, taking out, and prioritizing projects) including periodic activities that involved in selecting from available projects meeting the organization’s objectives according to constraints (see e.g. Archer and Ghasemzadeh, 1999). Thus, as Nowak (2013) argues, project portfolio management is a recurring dynamic and interactive decision process, where the portfolio must be constantly updated and revised. The result of this process is a constantly available well-selected and ranked set of projects.

In the literature there are two distinct directions of research on selecting project portfolios (Nowak, 2013). In the first group there are articles providing general recommendations with few systematic procedures especially addressed to practitioners. The second group includes quantitative decision support techniques dedicated to researchers mainly.

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However, it is behind debate in both sides that for selecting the right projects at the right time multiple criteria should be taken into account and recently a significant number of literature become available on methodological tools for this (Gutjahr et al., 2010; Anagnostopoulos and Mamanis, 2010; Kremmel et al., 2011; Elazouni and Abido, 2011). These sources provide complex, formal mathematical solutions for multiobjective cases in project portfolio selection, but besides the thorough operational issues, the criteria selection is left out of scope. These techniques employ sophisticated computation tools, but the models suggested often oversimplify the problem.

The emerging important question is what quantitative and qualitative criteria must be considered and how to include them in a portfolio selecting system that will be suitable for both the practitioners and the researchers.

2. Ranking Criteria for Project Portfolios

   Ranking by net present value (NPV) is a common practice that results in the sorting out the financially weakest projects from the portfolio. However, the standard method for NPV calculation often focuses only easily calculable events and processes, thus the more subtle details and benefits of the project may be missed out of the assessment.

   Our view is that project ranking should look beyond the NPV by setting up a more sophisticated criteria system. To establish a sound system the development of a well-structured hierarchy seems necessary.

2.1. Financial Criteria (FI)

   In the mainstream “perfect market” framework of finance, the only criterion is the Net Present Value (NPV) that shows the added value of a business idea. If there are infinite resources, and no market frictions, then all projects with positive NPV is undertaken. If the resources are scarce, e.g. there is a limited budget, and then project ranking is needed. The simplest project ranking method is the ranking by the NPV/CAPEX ratio, referred as Profitability Index (PI), indicating the project financial value expected to generate by one unit of the investment.

   A project’s Profitability Index can be given as the ratio of the NPV and the actual capital expenditures (CEXP,i). Ranking by PI is obvious: the higher the PI is the higher the project must be prioritized.

2.2. Strategic Criteria (STI)

   Business strategies often declare quantifiable but hardly monetizable objectives (e.g., increase of market share, improvement of business performance). Literature review suggests that the project portfolio management serves as an important and effective tool for strategy implementation. Moreover all the project portfolio management process must be subordinated to the strategy of the organization (Archer and Ghasemzadeh, 1999; Martinsuo and Lehtonen, 2007; Voss and Kock, 2012; Teller and Kock, 2013). Meskendahl (2010) examined the interference of the strategy, the project portfolio management, and the success to draw together strategy formulation and implementation. Although the existing research shows a positive relationship between isolated concepts, he claimed the lack of coherent and integral framework from strategy to success. Therefore, Meskendahl conceptually extended the current research in portfolio management by strategic orientation. Killen et al. (2012) conducted research on the application of strategic management theories to project management and project portfolio management. These research experiences outline the successful application of strategic management theories highlighting the advantages as well as the challenges of adopting theories from strategic management for PM and PPM research. Their paper makes primary contributions to the PM, PPM, and strategic management fields, and as a conclusion, it provides an obvious evidence of benefits that can be obtained by the application of strategic management approaches to PM and PPM research. PM and PPM are defined as subsets among management and strategic management research rather than as separate domains. As it is an adequate statement for project management, project portfolio management must be aligned as well to strategy, therefore a strategic element is taken into consideration for evaluating, prioritizing, and selecting projects properly. Since there is a positive correlation between the strategy-conform portfolio selection and project portfolio performance (Müller et al., 2008), we suggest strategy criteria to be included into the project ranking exercise. Projects with higher alignment with the strategy should be ranked higher than those more independent of the strategy.
Business projects owned by enterprises normally have many stakeholders. Success or failure largely depends on the project’s conformity with the expectations of the society and local communities, as well as with the prevailing political regimes and legislation. Another key success factors may include the cooperativeness of business partners and the quality of the available services and suppliers.

In the recent literature review the significance of stakeholders appeared. Unger, Gemünden and Aubry, (2012) outlined the importance of stakeholders in project portfolio management. Project portfolio management offices (PPMOS) are centralized units and subsets of project management offices (PMOs) responsible for the organization’s portfolio focusing on the demands of various stakeholders. “[T]he tasks of PPMOs may be derived from these key stakeholders’ requirements and their need to delegate management obligations” (Unger, Gemünden and Aubry, 2012, p608). Also, PPMOs have to guarantee the implementation of stakeholder interests and needs besides the organizational goals. Their comprehensive role-based research outlining organizational issues basically stemmed from the stakeholders’ demand. Beringer, Jonas and Kock (2013) refer to the stakeholder behavior and stakeholder management as key success factors within portfolio management. Their empirical study project portfolios investigating the effect of portfolio-internal stakeholders on project portfolio success pointed out a clear impact of stakeholders. Even the latest version of PMBoK (2013) extended the set of knowledge areas with the project stakeholder management. Although the literature expresses the significance of the stakeholders in their methodologies only implicitly the underlying models do not take sufficient note of that. Agreeing with the literature above emphasizing the importance of stakeholders, we also state that it must be a determinative and fundamental element in portfolio selection. We go further than the referred sources, and think that the criterion of stakeholder is worth pulling out from the large conceptual criteria set and treating independently in the ranking model.

Creating a lobby map accommodating all the stakeholders affecting the project is especially crucial for large-scale and complex projects. Negligence or undervaluation of stakeholders’ interests may result in serious difficulties in the projects’ implementation phase, or as a worst case, may lead to the premature end of the project. Projects with wider acceptance from stakeholders should be ranked higher than those with non-compliance or resistance to them.

2.4. Learning Criteria (OLI)

Long-term business success may depend on whether the organization is capable to learn from its own previous projects and is able to turn the lessons learned into future potential benefits. For instance, Gutjahr et al. (2008, 2010) built models for project portfolio selection, paying specific attention to competence development. Their model is based on the gains from the increment of desirable competences. The tools proposed are rather sophisticated (nonlinear mixed-integer program, greedy heuristics, metaheuristics, etc), however, they seek an optimal staff assignment, and criteria from other fields are left out. Killen et al. (2012) conducted a research on PPM and also outlined the significance of knowledge and learning. Although strategic management theories are applied with recognizing the significance of learning for project and portfolio management, the criteria set is limited (e.g. lack of financial thinking). In the work of Purnus and Bodea (2014) criteria related to project opportunity including experience that leads to a competitive advantage for a successful portfolio project management emerged. They built a large and complex set of criteria. For a more practical model, some less significant criteria can be left out (i.e. contractual conditions), and some of them can be merged (financial criteria can handle the important risk-related questions). The opportunity for learning gained during a project is always a challenge to quantify, but it is obviously to be considered to ensure future benefits. Projects from which we learn more contain more exploitable potential and should be ranked higher than those without learning.

3. Utilization of the Proposed Ranking Criteria

The main steps of a general PPM process (portfolio setup, evaluation, prioritization, selection, execution etc.) were integrated with more phases by e.g. Teller et al. (2012). This research, however, mainly concentrate on the mathematical implementation and realization with bi-criteria or multi-criteria analyses. Ballestero and Romero (1996) provided a solution with defining a bi-criteria utility function for portfolio problem to average investors. Gutjahr et al. (2010) formulated a multi-objective optimization model including employee competences and their evolution, and Anagnostopoulos and Mamanis (2010) developed a three-objective portfolio optimization model with
discrete variables considering further financial components. For the complex ranking problem we studied, however, the AHP (Saaty, 1977) provides a flexible, multiobjective method that involves even the hierarchy of criteria.

The focus of our investigation is to provide an integrated ranking model combining financial parameters with additional non-financial elements important for managing portfolios. The proposed ranking method is based on the four criteria groups discussed above resulting in the overall Criteria Indices: $FI$ – Financial Index, $STI$ – Strategy Index, $SHI$ – Stakeholder Index, $OLI$ – Opportunity for Learning Index.

Based on the criteria above the overall Project Priority Index ($PPI$) is as follows:

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PPI_i = \alpha \times FI_i + \beta \times STI_i + \gamma \times SHI_i + \delta \times OLI_i$$

(1)

where $\alpha$, $\beta$, $\gamma$ and $\delta$ are the respective group weights also to be defined by the management preferences. Only those highest $PPI$ projects can enter in the project portfolio, whose summarized capital expenditures ($C_{EXP,i}$) do not exceed the CAPEX budget defined by strategy.

4. Summary and Conclusions

Based on an extensive literature review dealing with project portfolio ranking we suggest setting up Financial, Strategic, Stakeholder and Opportunity for Learning Criteria groups. In line with this categorization we attempted to define the ranking criteria for the petroleum exploration. We believe that the negligence of the systematic review of criteria impact may jeopardize business sustainability and closes the gates to organizational development on the long run. Since our criteria definitions can reflect to the special characteristics of businesses in any industry, we will continue this research with an illustration presenting how to implement this model in corporate environment.

References


