

NPD Risk Management with Experiential Learning Oriented Method

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Abstract

Selecting the right project is crucial for the success of a company, especially in project-based business models. The main purpose of this paper is to describe how a company can create a tool to support both portfolio management and project management in a multi-project environment by describing the factors contributing to the success of projects in the organisation. The success factors are based on the company's experiences from previous projects, as well as the success factors identified in the literature.

The method is called an experiential learning oriented method for risk management (ELO RM). The method emphasises experiential learning and uses lessons-learned material in a unique manner and offers clear steps that facilitate learning from the projects to improve the organisational performance. The method also acknowledges that the organisation does not operate as an isolated unit and that co-operation with the other companies is an important factor contributing to projects' success. The method is based on research on more than 10 industrial cases. Researchers are interested in further studies on how the experiential learning oriented method enhances learning in projects and the organisation.

Keywords: experiential learning, risk management, new product development, organisation learning

1 Introduction

In project-based business models, selecting the right project is crucial for the success of a company (Kaiser, El Arbi, & Ahlemann, 2015). Available project alternatives usually exceed the number of projects that can be carried out with the organisation's resources. Marcelino-Sadaba et al. (2014) summarise that when selecting the right project, the following factors should be taken into account:

1. project goals are aligned with the overall business strategy,
2. expected results are profitable and

- there is sufficient technical and management capacity in the organisation to undertake the project.

High quality project selection criteria, especially ones that permit measuring and comparing the uncertainties of individual projects, are essential to ensuring the quality of projects assembled into the final portfolio (Davis, Fusfeld, Scriven, & Tritle, 2001). According to Olsson (2008), projects in the portfolio may involve common risks that may become increasingly relevant business issues at the portfolio level and, therefore, need to be taken into account by managers. This indicates that top managers need visibility of risk commonalities and trends in the portfolio.

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The experiential learning oriented method for risk management (ELO RM) is part of a larger context. It contributes to project management, project execution and portfolio management activities. The experiences from project execution and portfolio management are used as inputs to continuously develop and adapt risk management. This facilitates organisational learning based on experiential learning from projects. The ELO RM position in the context is described in Figure 1.

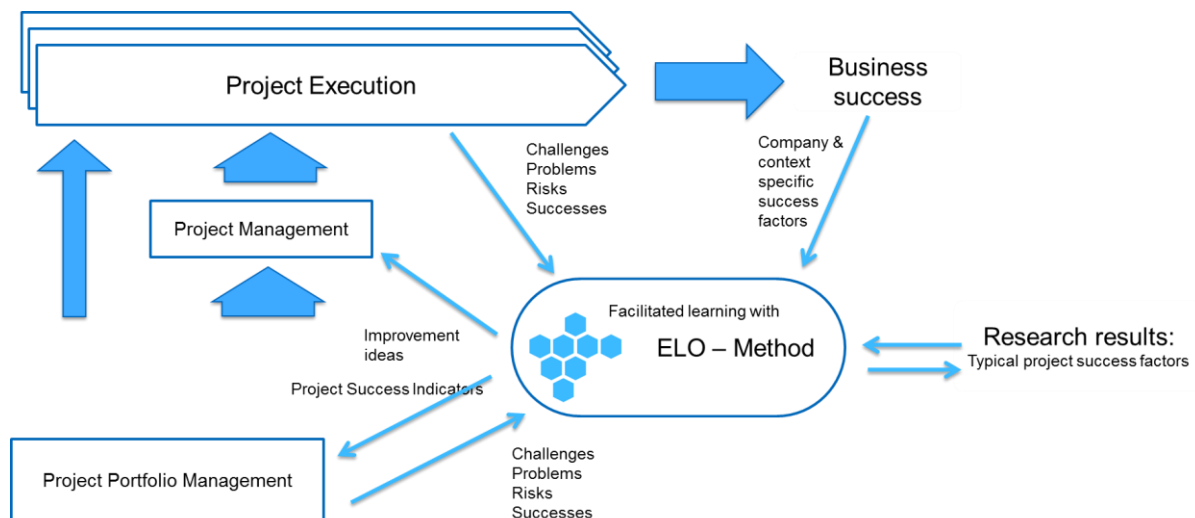


Figure 1. Overview of the ELO method.

2 Theoretical background

Each project is tied to the unique environment specific to the organisation in which it is carried out (Todorović, Petrović, Mihić, Obradović, & Bushuyev, 2014). Therefore, the project cannot be understood without taking its history into account (Engwall, 2003). Projects are also carried out in a wider environment involving external factors that cannot be influenced; nevertheless, these external factors can be influenced by project results later on.

The organisational culture is based on the organisation's history. The culture is a receptacle for and disseminator of how the organisation has chosen to react in the future and what it has experienced in the past (McDermott & O'Dell, 2001). The organisational culture also determines which topics are identified as risks threatening the projects' progress. Therefore, due to the organisational culture, some potential risks can be ignored, even though there is factual information available regarding their negative impact on the project.

The most commonly used criteria for the assessment of a project success are time, costs and meeting the user expectations. However, they might not be the best criteria because the success judgement is time and evaluator dependent (Gericke, 2011). During the early phase of the project, keeping to the schedule is the most important criterion for success, but in the middle of the project, the cost is more important than the schedule. When the project has been completed, the project success is evaluated on the basis of quality. However, the project managers and the users use different criteria to evaluate quality.

Success factors are inputs into the management system that lead directly or indirectly to the success of the project or business (Cooke-Davies, 2002). When Fortune & White (2006) analysed the success factors cited across 63 publications, they noticed that the three most cited factors were:

1. the importance of a project receiving support from senior management,
2. having clear and realistic objectives and
3. producing an efficient plan.

81% of the publications included at least one of these three factors, but surprisingly only 17% cited all three. In other words, there is only limited agreement among researchers on the factors that influence a project's success (Todorović et al., 2014).

Risks are seen as possibilities of an undesired outcome disrupting the project (Škec, Štorga, Rohde, & Marjanović, 2014). An unwanted and unexpected disturbance in the planned project course can lead to project failure (Gericke, 2011). It seems that projects fail mainly due to problems related to project planning, general management activities, the project team and insufficient use of specific techniques, such as risk management. In a multi-project environment, project failure can also be triggered by a previous or parallel project.

Continuous learning and development is considered the highest level an organisation can reach in terms of project management maturity (Todorović et al., 2014). Organisational learning is dependent on the members of the organisation exchanging and combining existing information, knowledge and ideas (Kogut & Zander, 1992), as well as internalising and applying what they have learned (Anantatmula, 2009). Learning is reflected as changes in the collective knowledge, value base and behaviour, which subsequently affect the organisation's performance (Senge, 1990).

The experiential learning theory describes learning as a process in which knowledge is continuously derived from experience and tested out in practice (Kolb, 1984). According to the experiential learning theory, groups learn from experience when the group members talk about their experiences, come up with new ideas and experiment with them (Kayes, Kayes, & Kolb, 2005).

A large number of project assignments is repetitive in nature, with little deviation in relation to the progress of projects within the organisation (Engwall, 2003). Even radically unique

project missions can consist of several non-unique technological components and administrative procedures (Gericke, 2011). However, even in project-based organisations, in which the projects embody most of the business functions, there are seldom any organisational mechanisms for transferring knowledge acquired in one project to other projects (Prencipe & Tell, 2001). In addition, project-specific learning only occasionally leads to organisational learning (Swan, Scarbrough, & Newell, 2010).

Successful management of a project requires learning from excellence, as well as from disasters (Gericke, 2011). Unless the lessons learned – especially those related to the project management experience – are communicated to the subsequent projects, there is a risk that the same mistakes will be repeated (Busby, 1999). Lessons learned include any form of knowledge, gained from direct experiences, successful or otherwise, that can be used to improve performance in the future (Jeon, 2009). It is gained in specific situations in the business operations, which exist within the organisational boundaries.

3 Creating project success criteria based on experiential learning

The case company is a Finnish manufacturing SME, 95% of whose sales come from global markets. It has evolved from a projecting company into a product delivery company and nowadays has a dedicated R&D team. However, the engineering resources are shared between the delivery projects and the R&D projects. The products include mechanical, electrical, automation and software engineering products.

This co-operation between the authors and the case company was initiated by the company's R&D manager. While doing his master's thesis on the profitability estimation of new product development projects, he noticed that the company did not have tools for assessing the risk level of the projects for portfolio management purposes. The master's thesis was supervised by one of the authors. The authors proposed the framework in Figure 1 and the application of the ELO RM approach in the company.

The overall process for creating new product development project (NPD) success criteria is illustrated in Figure 2. The work was started by studying current challenges in the projects. The authors interviewed personnel working in R&D to understand the current status and challenges in the R&D projects.

The first workshop was arranged to review a large and complex NPD project to capture lessons learned. Both challenges and successes were identified in the workshop. In Workshop II, three more NPD projects were analysed and captured lessons learned from both workshops were summarised. The participants also identified the most important factors concerning the NPD projects' success in the company.

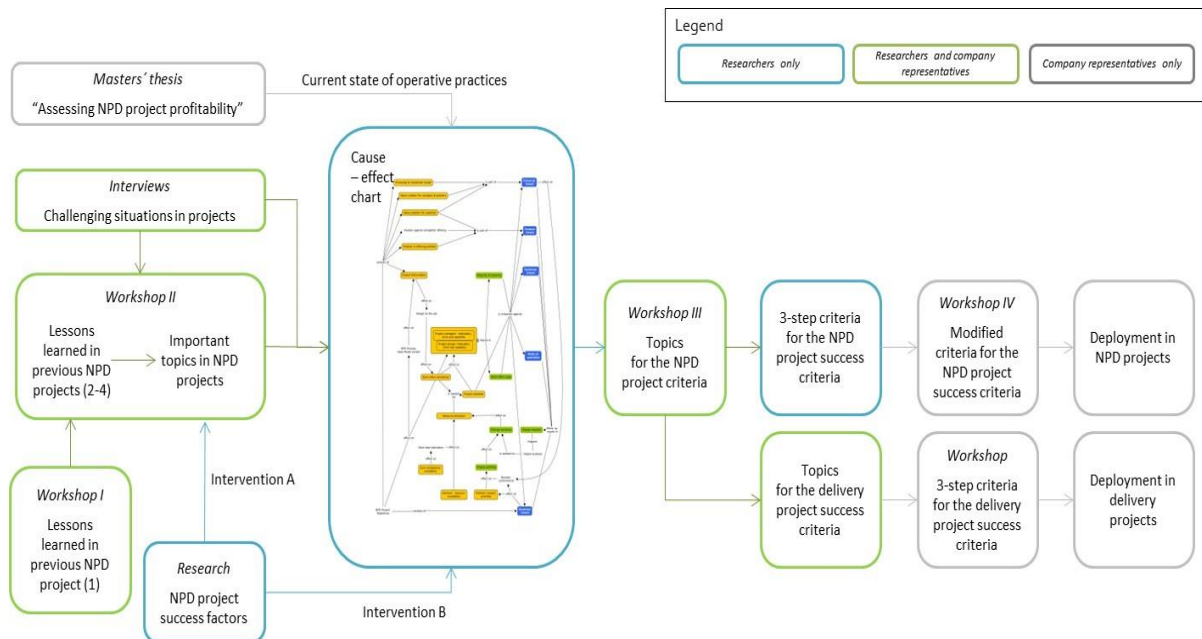


Figure 2. Process of creating project evaluation criteria for R&D projects in a company.

To overcome the effect of organisational culture and habits as a blindfold, the method includes two interventions. We apply Schön’s model of intervention (Schön, 1983). The interventions ensure that the organisation also takes extra-organisational input (e.g. research results or industry wide best practices) into account when identifying the success criteria for the development projects. Intervention A was carried out in Workshop II when the researchers provided ‘food for thought’ in the form of the FocusCHAMPION cards created during a previous research project (T. Juuti, Kopra, Lehtonen, Tuokko, & Lanz, 2015). Focus cards describe various topics that need attention in the project (see Picture 1).



Picture1. FocusCHAMPION cards.

Each card has a specific focus that creates value for the R&D project. The cards help the project personnel to shift their focus from tasks and their relation to the project goals and project outcomes. Topics include, for example, partners’ value capture, project personnel’s commitment and motivation, as well as SMART project goals (SMART = specific, measurable, achievable, realistic and time-bound), and there are 41 focus cards in total. Picture 2 shows the setting during the workshop.



Picture 2. Focus cards in use (Workshop II).

The participants indicated which Focus cards were relevant for successful projects. They also noted which focuses were missed in particular projects, thus creating challenges in the projects.

On the basis of the analysis of challenging situations in the projects and the workshop results, the authors created a systemic cause-effect chart (see Figure 3). The company's current operative practices were taken into account in the creation of this chart. The goal was to indicate factors within the company's zone of proximal development (Vygotsky, 1978). This means that the authors intervened with factors that were somehow understandable for the people involved in this process.

The cause-effect chart illustrates the dependencies between the identified main factors contributing to the NPD projects' success in the case company. It also provides an insight into the interrelations between causes and their impacts, thus revealing dynamics and possible problems in the system. As a second intervention, the authors highlighted some topics from the chart as a suggestion for the evaluation criteria for the NPD projects in orange. Factors highlighted in green are operative practices. Operative practices are not included in evaluation criteria, as those are developed and managed separately from the risk management practice.

During second intervention, some factors in blue were also added to the cause-effect chart. These additions indicate the authors' approach towards new product development: the project objectives should include intentions for five separate domains (T. S. Juuti & Lehtonen, 2010). Those domains are:

1. Business Intent, covering value creation for the company and the partners,
2. Financial Intent, focusing on financing model,
3. Product Intent, describing the value for the customer,
4. Technical Intent, statements on technical implementation and
5. Mode of operation, describing how the project is executed.

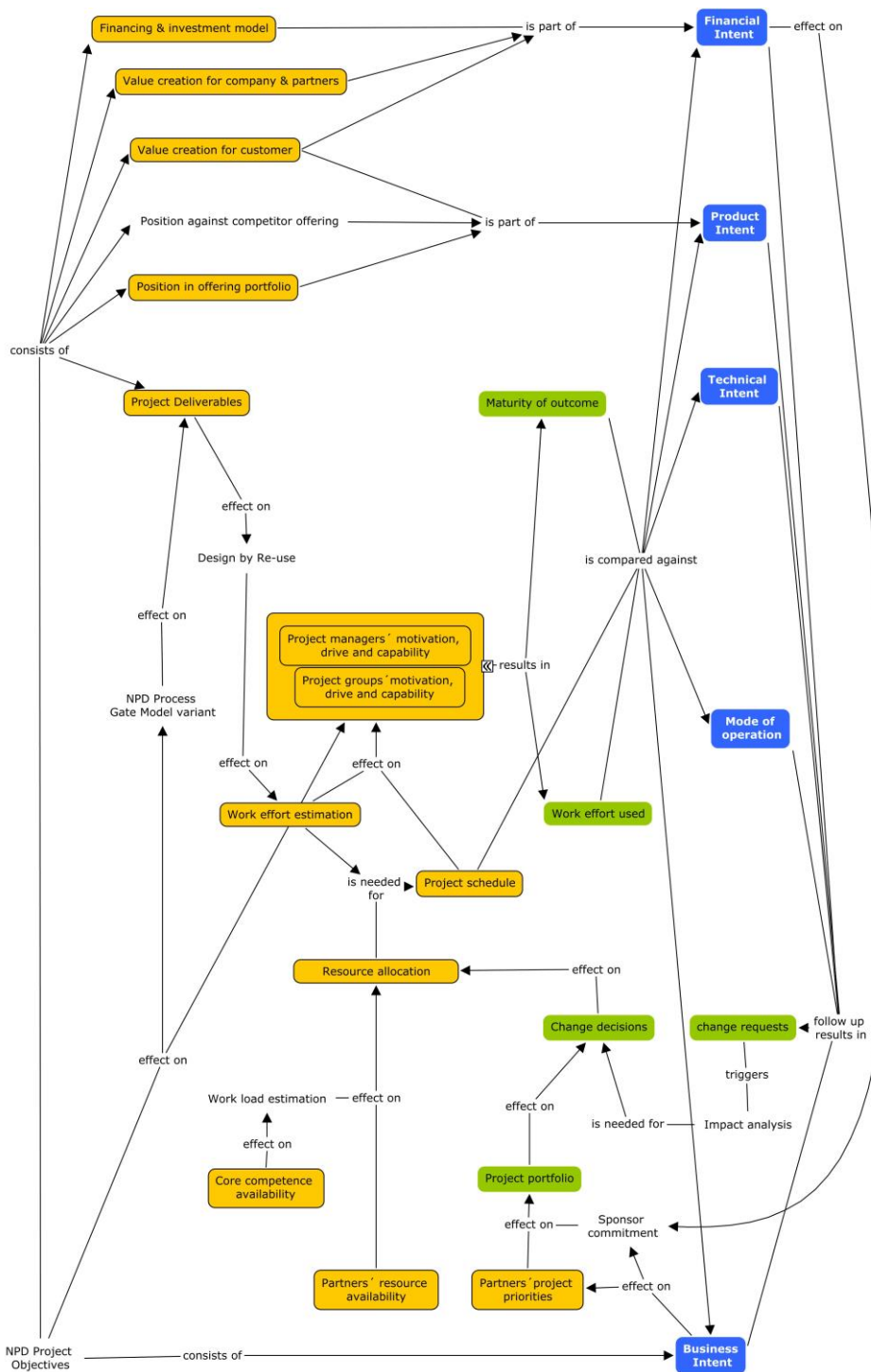


Figure 3. Modified cause-effect chart for the case company.

The cause-effect chart was presented to the company representatives in Workshop III. The authors presented the chart and explained the underlying logic. The company representatives commented on and modified the chart, and as a result some factors were removed and some new factors were added. In the final version of the cause-effect chart (Figure 3), the agreed upon success criteria topics for the NPD risk level assessment were indicated in orange.

Then, the authors specified scales for each success criterion. The 3-level anchored scales describe the status of the criteria as poor, adequate or desired. Anchored scales consist of

numeric indicators, each of which is associated with a set of words or phrases that help the respondent to anchor his or her evaluation (Davis et al. 2001). The scales define the target level for the NPD project as per each success criterion, thus indicating to the project managers how the projects are evaluated and what needs to be done to ensure success (see examples in Table 1).

Table 1. Example of the NPD project success criteria.

CRITERIA	STATUS		
	Poor	Adequate	Good
Project funding & authority	Project is partly financed.	Project is fully financed and budget is fixed.	Project is fully financed by a reliable source and it tolerates a budget overrun of +50%. Project management can decide how the money is used.
Value creation for business	Project ROI is over 18 months.	Project ROI is 8–18 months.	Project ROI is less than 8 months.
Value creation for customer(s)	We do not know if the project deliverables create value for the customers OR the project creates less than 5% of value in comparison to the customers' current solution.	Project creates 5–15% value in comparison to the customers' current solution.	Project creates more than 15% value in comparison to the customers' current solution.

The authors delivered the list of success criteria to the case company. The company arranged a Workshop IV to analyse and fine-tune the wording to match company-specific terminology. After the criteria had been agreed upon, they were taken into use in a recently started NPD project that functioned as a pilot.

While discussing the NPD success criteria in Workshop III, the company representatives were also comparing the NPD projects to delivery projects. The authors were not involved in the fine-tuning of the topics, defining the 3-level anchored scales (in Workshop V) or the deployment of these success criteria, but the company also plans to extend this practice to delivery projects.

4 Discussion

The created ELO RM method enables the identification of relevant and valid success factors for company specific contexts. The method results in a project evaluation tool, including the selection of success criteria and the definition of the anchored scales for the evaluation. The success criteria are specific to the organisation and context and, therefore, are not applicable to other organisations or contexts. The localisation of success criteria using terminology familiar to the company is part of the method.

The defined success criteria indicate to the project managers what needs to be done to ensure the success of the project. The method ensures that project managers do not need to start a risk assessment from scratch because the typical risks have already been identified.

Additionally, the status indicators tell explicitly what the desired status for each success criterion is. At the project portfolio level, project reports with the defined success criteria allow senior managers visibility of the risk commonalities and trends in the project portfolio and facilitate the planning of preventive and corrective actions accordingly.

ELO RM differs from Project Management Body of Knowledge in a major way. PM BOK describes several project routines with the purpose of managing the project and project risks. It originates from the needs of projecting business and big delivery projects. ELO RM is based on developmental work research, with the company's current situation, business environment and current operative practices used as a starting point. The development work is performed using facilitative, participatory methods, and it builds on people's competences and zone of proximal development. This is also the critical issue with this approach – how to identify the factors to be presented during intervention B.

Our earlier research on lessons learned indicated that in one case company, the main focus was on technology-related topics and operative practices. In this case company, the operative practices were not considered as important. The other company was large, a multinational company with more than 20,000 employees, while this company has fewer than 200 employees. This might explain the difference in focuses.

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