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Problems in Managing Internal Development Projects in Multi-Project Environments

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PROBLEMS IN MANAGING INTERNAL DEVELOPMENT PROJECTS IN MULTI-PROJECT ENVIRONMENTS

Abstract

This article identifies problems in managing multiple internal development projects. The research methodology employed organisation-specific interviews, surveys and workshops on two case project portfolios. Project portfolio management studies provide one view on existing knowledge in this area. The study results in six relevant problem areas: 1) Inadequate project level activities, 2) Lacking resources, competencies and methods, 3) Lacking commitment, unclear roles and responsibilities, 4) Inadequate portfolio level activities, 5) Inadequate information management, and 6) Inadequate management of project-oriented organisation. The article suggests further analysis and development of managerial practices on these areas.

Keywords: project management, project portfolio management, multi-project management, programme management, project-oriented business, internal development project

INTRODUCTION

Today's business environment is complex and requires faster decisions, better allocation of scarce resources, and a clearer focus [1]. Most of the work performed in modern organisations more and more involves project work [2],[3]. An organisation consisting of a constantly changing mix of large and small projects presents senior management with new challenges in resource planning, prioritisation and monitoring [4].

Adherence to time, scope and cost requirements in single projects may provide a company with increased income and value for the near future. However, to complement this view, the project portfolio management introduces doing the right project, creating a link from the projects to the organisation's strategy and, simultaneously, adopting the long-term view.

The literature on project portfolio management mostly focuses on investment projects, management of technology and innovation, or R&D management. This occurs as such internal projects often are of most relevance in terms of future business success and implementation of business strategy. Cooper et al. [1] have identified the problems encountered in inadequate portfolio management and respective solutions which limit to new product development projects. Combe [5] has, in turn, identified problems related to cross-organisational project management. However, in general, studies relating to the identification of problems in managing multiple projects are few. Furthermore, studies concerning the management of internal development portfolios seem rare. This paper makes an attempt to bring more insight into problems in managing entire portfolios of internal development projects.

PROJECT PORTFOLIO MANAGEMENT

In the literature, the concept of *project portfolio management* appears in various guises. *Programme management* and *multi-project management* are examples of closely related terms. In some contexts, they are almost synonymous to project portfolio management.

Archer and Ghasemzadeh [6] and Dye and Pennypacker [7] define a project portfolio as a group of projects that are conducted under the sponsorship or management of a particular organisation. They define further that these projects must compete for scarce resources. The three well-known objectives of portfolio management are: maximising the value of the portfolio, linking the portfolio to the strategy and balancing the portfolio [1]. According to Platje et al. [8], a portfolio is a set of projects which are managed in a co-ordinated way to deliver benefits which would not be possible to achieve if the projects were managed independently. A central, strategic task of project portfolio management is to maintain corporate identity and to hinder it from being torn apart by individually implemented projects which have no links to each other [9].

The definitions of portfolio management [6], [7] are similar to many definitions introduced for a project programme. For example, Turner [10] and Poskela et al. [11] emphasise that, in a programme, projects form a coherent group of projects that are managed in a co-ordinated way, for added benefit. Murray-Webster and Thiry [12] define a programme as a collection of change actions (projects and operational activities) purposefully grouped together to realise strategic and/or tactical benefits. According to Turner [10], programme management includes, among others, the management of interfaces between projects and the prioritisation of resources. The objectives of projects different projects under one project programme are interdependent [8]. Turner [10] emphasises the importance of considering the overall strategic resource-sharing scheme and balancing responsibilities against corporate objectives in programme management. Furthermore, according to PMBOK [13], a programme consists of several associated projects that will contribute to the achievement of an overall strategic plan. CCTA [14] uses the term portfolio while defining programme management as the co-ordinated management of a portfolio of projects that change organisations to achieve benefits that are of strategic importance.

Multi-project management can be defined in various ways. However, we adopt the widely accepted view that multi-project management refers to more than one project that subsumes a portfolio and a

programme. Based on the above discussion, we appreciate both the project portfolio management and programme management areas with their contribution to the strategic and business-oriented management of multi-project environments. Portfolio and programme management include inter-related management processes and managers in organisations. We use the term project portfolio management in the following; however, we interpret project portfolio management broadly. This broad interpretation includes aspects of both portfolio and programme management studies, with strategic management of multiple projects towards business objectives as a part of the overall management of the company, management of interfaces between projects and co-ordination of collections of projects, and management in accordance with resource and other constraints.

Portfolio management process is discussed in the literature [6], [1], [15]. Typically, the process is divided into the following phases: development of portfolio strategy, portfolio reviews and individual analyses of projects. Turner and Keegan [16] analyse the general organisational issues of a project-based company. A project office is seen as an organisational structure important to the successful management of multiple projects [17], [6], [7], [18], [1], [19], [20], [21], [22],[23], [24]. Cooper et al. [1] introduce findings and conclusions on the management of cross-organisational new product development portfolios. The organisational success criteria of a project have been introduced by several authors (e.g. [10]; [1], [20], [19], [25]).

RESEARCH QUESTION

Based on our broad view on the project portfolio management area, we use the term project portfolio management for referring to the underlying managerial context. The motivation for this study is the following. Identifying the problems and understanding their relationship in the organisation provides a solid basis for overcoming them. The problem identification also enables bringing forth the areas relevant in multi-project management, that is, the areas to be considered carefully when developing

multi-project management practices further, both in the field of research and in deriving organisation-specific managerial solutions.

This paper investigates problems encountered in portfolio management in matrix organisations. The research question is:

- What are problems and problem areas in project portfolio management?

Answers to the research question are sought from literature and from two case portfolios. Findings from both sources are analysed and compared against each other. The emphasis of this paper is on empirical findings and in comparing them to the existing knowledge.

TWO CASE PORTFOLIOS – INTERNAL DEVELOPMENT PROJECTS IN MATRIX ORGANISATIONS

This paper employs empirical data gathered in project portfolio management research projects at the TAI Research Centre at the Helsinki University of Technology, Finland. The research projects were initiated in the early 2001 and they aim at developing project portfolio management practices for one chosen case portfolio in each organisation. The empirical findings of this paper are derived from two organisations participating in the research projects, and respectively, from two case portfolios. The case portfolios consisted of internal development projects. Both case portfolios include projects that cross multiple organisational units. The organisation and management structure in both organisations is a matrix. Matrix organisations are a blend of functional and projectised characteristics. The role of projects in a matrix organisation and related problems are discussed widely in the literature (e.g. [26], [27] [28]). The case portfolios and some important characteristics of internal development projects are discussed in the following.

Both the type of the project and the organisational environment presumably affect the recognition of problems and features in the case portfolios. As far as the environment is concerned, both organisations have a reasonable organisational know-how and capability for running single projects. Both

organisations have, since several years, introduced local processes and guidelines for managing single projects. Furthermore, both organisations have invested in extensive project management training and introduction of common corporate-level project management procedures for single projects.

Shenhar et al. [29] classify projects into external and internal. Their starting point is innovation management literature that makes a distinction between incremental and radical innovation. External projects are typically preceded by developing products to the market. Wheelwright and Clark [30] call such projects commercial development projects. A more direct interpretation of external projects is the one for organisations running projects for other organisations [31]: such projects are often consist of production or manufacturing devices, run only for organising the more or less pre-determined work according to a contract [m]. Shenhar et al. [29] divide internal development projects further into problem solving, utility, maintenance and research projects. They are precursors to commercial development, and they can be either strategic or operational in their nature. Utility and research projects have usually long-term perspective and can, thus, be considered as strategic projects. Problem solving and maintenance projects usually focus on shorter term and can be seen more as operational projects. Internal development projects typically aim at performance improvements. Typical examples of internal development projects in the two empirical cases include development of business processes, internal information technology development, organisational change or re-engineering, and investments in new equipment, major software, and other capital projects.

EXISTING RESEARCH ON MANAGERIAL PROBLEMS IN PROJECT PORTFOLIOS

We have not found studies on problems related directly to the management of a portfolio of internal development projects. In the following, we introduce problems encountered in managing portfolios of other project types than internal development projects. Cooper et al. [1], [32] have identified six problems in project selection and portfolio management faced by companies developing new products.

We use the categorisation of Cooper et al. to study the current knowledge on problems in portfolio management:

1. *No link between strategy and project selection* (also referred to in [33]). Despite clear business and new product strategies, the spending on R&D projects does not often reflect the stated strategy and priorities. Thus, there is no clear link between the strategy and the selection of projects. Also, communication of the strategy is weak.
2. *Poor-quality portfolios*. Too many new product projects are weak, unfit and mediocre. In addition, success potential at launch is inadequate. A Brookings Institute survey [34] even reported a trend among information system professionals regarding their evaluation of new project ideas: fully 86% of those responding stated that their organisation had no selection criteria to separate half-baked ideas out from viable projects.
3. *Reluctance to kill projects* (referred to also in [33]). As soon as a project has been started, it takes on a life of its own and is allowed to proceed until the end of the development work, even if its implementation is no longer justified on a business basis. Poor projects are hardly ever stopped in the midst of the implementation, mainly because there are no decision criteria for prioritising and killing projects.
4. *Scarce resources, a lack of focus*. Most companies have too many on-going projects for the available resources (referred also to in [35]). Inadequate balancing of resources often translates to additional pressure to multitask which leads to a greater time to complete the project. The result often is a delayed time for a product to market, thinly spread resources across projects, higher failure rates, poor quality of information and lowered morale (also referred to in [36]).
5. *Selecting short-term and easy projects*. Combe [5] states that a traditional bottom-up identification of projects is often inadequate to ensure selection of the most important things on which to spend the resources. When aiming at reduced cycle time and increasing number of new

products, companies have a tendency to implement the short-term, easy, and cheap projects, such as product modifications and extensions (also referred to in [36], [2]). As a consequence, they are reducing their future success potential and competitive advantage.

6. *Information overflow and lacking quality of information.* The number of tools available for portfolio selection is abundant. Managers may become confused with the amount of information available for decision making but may not be able to identify the relevant information or realise the inaccuracy of information and estimates. Regardless of elegant and sophisticated portfolio selection and decision tools, if the information input is poor, so will the decision making be.
7. *Decision making basing on power* (also referred to in [33], [37]). Power may originate from personal attributes, such as charisma, or a person's position and authority within the organisational structure. Martinsuo [37] writes that Pfeffer's [38] study indicates power to be more important in the following: major decisions where there are interdependencies; for domains in which performance is more difficult to assess; and in instances where uncertainty and disagreement are likely. Any company process can become politicised when strong-willed, charismatic project leaders beat out their less competitive colleagues for resources [39]. The field of project management is particularly fraught with political processes, for several reasons. Project managers do not usually have a stable base of power, so they use other methods of influence in order to secure the resources from other departments [27]. Getting approval for a project start-up is not just a rational exercise of informing others that a project is important; rather, it is a long process of generating support [40].

RESEARCH PROCEDURE

The research was conducted in five steps during which the empirical data was gathered. All the five steps were carried out independently for the two case organisations, here referred to as Alpha and Beta. The results of the steps were integrated afterwards. The first step comprised a company-specific present-

state analysis (Step 1). The data to the analysis was gathered with interviews and by getting familiar with the organisation and related material. 14 persons were interviewed in Alpha and 6 persons in Beta.

Step 2 was a survey that served as a preliminary identification of problems existing in the case portfolios (Step 2). The aim of the surveys was to get an overview of the current problems in single and multi-project management of the case portfolios. The survey was executed by sending an open questionnaire to 17 employees in Alpha and to 13 employees in Beta. The respondents were persons closely related to the management of the case portfolios or respective projects, and each person responded to the survey independently. 6 employees from Alpha returned the survey (response rate 32%) and 12 employees from Beta (response rate 92%). For each problem, the following data was gathered: short description of the problem; influence of the problem on everyday operations; suggested courses of action for improvement; and order of importance in respect to the other problems listed by the respondent.

In step 3, the survey data was grouped into preliminary problem areas which were then put in order according to their importance (Step 3). The preliminary problem areas were developed from the trends found in the survey data in such a way that presenting the areas of the organisation to its employees would reveal the field of problems in the management of single projects and the case portfolio. After the preliminary problem areas had been identified, each problem was placed into an appropriate area. Then, the importance of each problem listed in the survey was coded into numeric. The problem a respondent had stated to be the most important one in the survey was given 3 scores, the second most important problem was given 2 scores, and the rest of the problems were given 1 scores each. When the scores given to the problems placed into a certain area had been summarised and the problem areas had then been arranged by importance, the result was the order of importance of each preliminary problem area. After this, the preliminary problem areas from both organisations were integrated into 5 common problem areas. The organisation-specific weightings of the problem areas of the two organisations were given equal weights when deciding on the importance of the integrated preliminary problem areas.

The analysis was followed by one-day organisation-specific workshops where major causes were identified and a cause - effect map for each preliminary problem area was compiled (Step 4). The workshop of Alpha had 10 participants and that of Beta 9 participants.

After the problems had been identified in Steps 2 to 4, a post-workshop analysis on the data was conducted (Step 5). The problems identified in the survey and their causes were combined to replenish the understanding of the problems existing in the management of internal development projects.

Focused interviews in the case organisations supported the analysis. The results of the analysis consist of relevant problems and problem areas in managing internal development portfolios.

PROBLEMS FOUND IN CASE ORGANISATIONS

PRELIMINARY PROBLEM AREAS (RESULTS OF STEPS 1–3)

The analysis of the surveys resulted in the identification of preliminary problem areas. Figure 1 presents the weighted scorings that reflect the importance of the integrated areas. The symbol “*” in the figure denotes that the problem area has been identified in both organisations. Table 1 presents the content of preliminary problem areas. Each issue included in the table fulfil at least one of the following conditions: the issue was identified as a problem by both organisations, or it was mentioned to be a problem at least twice in the survey of either organisation. Approximately 70% of all the problems identified in the surveys fulfil at least one of the two of those conditions. The problem areas shown in the table are explained briefly in the following.

Figure 1. Prioritised graph of preliminary problem areas

Table 1. Preliminary problem areas and their relevant content.

Inadequate definition, planning and management of single projects*
The importance of the pre-phase of projects is neglected. The project scope is not defined detailed enough before the project start-up. Thus, reliable estimates on benefits, resource requirements and costs of the project are difficult to make.
Too strict schedules and resource estimates for projects.
Cost and resource use of the project is reported and monitored occasionally or not at all.
Project output is not aligned with objectives due to unclear definitions, changing objectives and/or improper monitoring of project work.
Progress and quality of a subcontractor's work is difficult to monitor and control.
The need of the real customer of the development work is not always considered properly. The need for the development work is not analysed properly.
Resource shortage and allocating resources improperly*
Resource shortage in general (i.e. too many projects for the resources available).
A lack of competent project managers and other project personnel.
A high turnover of workers.
Project work is frequently on the shoulders of the same experts. Experts suffer from resource shortage but the other staff are involved in the project work only occasionally.
Project work has often second priority. 'Official' full-day responsibilities are prioritised over project work, and at the same time, allocated resources are taken away from projects.
Lacking commitment and unclear responsibilities*
Organisational responsibilities are not defined clearly. Roles and responsibilities differ from a project to another and authority issues between projects are not considered.
Business managers do not seem to commit to guiding and monitoring projects.
Inadequate portfolio level activities*
Overlapping projects and tasks both within an unit and between units.
Objectives of different projects are not systematically integrated to the strategy or to holistic end results of the portfolio.
The links between projects are not considered systematically.
No project prioritisation and no methods for prioritisation.
Others
Information on all projects is not available centralised. Information on projects does not flow adequately within one unit and between units.
Short-term development initiatives.
Conflict of interest between functional management and management of the cross-organisational portfolio. Priority and resources for cross-organisational projects come from functional management - cross-organisational priority for projects is not considered.

The areas of '*Inadequate definition, planning and management of single projects*' and '*Resource shortage and allocating resources improperly*' stand out from Figure 1. The former was viewed as the most important area in single and multi-project management. It reflects the fact that single projects in the case portfolio are not being managed properly. The problems in this area mostly refer to the pre-

project phase and project monitoring and control. As far as the resource management is concerned, the organisations pursue, in general, too many projects for the available resources. Another problem is the lack of competent project personnel.

'Lacking commitment and unclear responsibilities' and *'Inadequate portfolio level activities'* indicate that organisational responsibilities have not been clearly defined. The most often mentioned problem within *'Inadequate portfolio level activities'* is the overlapping of projects and tasks. It indicates that the same work is done several times in one project or in different projects. Moreover, the objectives of different projects are not systematically integrated to the strategy. Additionally, the projects are not prioritised, partly due to a lack of methods for prioritisation.

ANALYSIS ON CAUSES FOR THE PRELIMINARY PROBLEM AREAS (RESULTS OF STEP 4)

A better understanding for each company-specific preliminary problem area was developed for both case portfolios in separate one-day workshops. The key idea behind this step was to identify causes for the problem areas, to find new problems and to study the inter-relatedness of problems. This was conducted through creating a cause – effect map for each preliminary problem area. Further elaboration of the preliminary problem areas also helped to better understand the content and nature of the preliminary problem areas.

Table 2 presents the identified relevant causes for the preliminary problem areas. The causes included in the table fulfil each at least one of the following conditions: 1) the issue was identified in a cause - effect map of both organisations, 2) it was marked in the workshop as being a significant problem in a cause - effect map of either organisation, or 3) it was identified several times in the cause - effect maps of either organisation. Approximately 80% of the causes for the preliminary problem areas identified in the workshops fulfilled one of the above three criteria, and accordingly, were included in the table of causes.

Table 2. Causes for preliminary problem areas.

Inadequate definition, planning and management of single projects*
Work not broken down to several smaller projects.
Objectives of the project change during the project. Red line is missed.
Monitoring and controlling of resource use and cost is infrequent.
and managing projects uniformly.
in tasks of few experts.
Unclear roles and responsibilities at the project and portfolio level. Roles and responsibilities of the steering committee and project personnel are unclear. The unit responsible for projects at the portfolio level is not clearly defined.
Project and steering committee personnel is not competent to manage the pre-phase and the development phase of the project.
Inadequate portfolio level activities.
Project work is given a second priority. Operational work is given priority over projects.
Organisation has not yet digested how to capitalise on projects.
Resource shortage and allocating resources improperly*
Pre-phase of the project is not done properly. Resource and schedule estimates are too strict.
Projects are not prioritised.
between units.
Workload of the projects is concentrated in tasks of few experts. Too many roles in too many projects per an expert.
task.
Unclear roles and responsibilities between project steering committee, project manager and project team. Project manager brings issues to steering committee which is not prepared sufficiently beforehand. Steering committee does operational project work an
Composition of the steering committee and the project team is generally too extensive and rigid. The resource use is not optimised. Persons are included into the teams to ensure their commitment to the project, not to bring value to the project work.
Projects are not stopped. There is no criteria for evaluating the value of a project. Stopping a project is considered as a failure.
Lacking commitment and unclear responsibilities*
change during the implementation phase. End users are not committed to the project output and the development phase of the project i
identify overlaps in projects between organisational levels and units.
Overlapping projects and tasks.
organisation.
Monitoring and controlling of resource usage and cost is infrequent.
Portfolio managers have not adapted their own importance, role and responsibilities as project decision makers. They make decisions also on operational project issues. There are no methods or guides for making a decision on the portfolio.
Feedback on projects is rarely given to the project level by the portfolio level.
Resource shortage. Members of the steering committee (often an extensive composition) do not have the time for the role and its responsibilities. Portfolio managers do not have time to discuss and decide on projects due to operational duties.
Management is not committed to reviewing projects, besides large strategic projects.
systematically similar to rewarding operational work.
Rapid and recurring changes in roles, responsibilities or organisation structure. Deficient feel of continuity.
Inadequate portfolio level activities*
the organisation between the levels and the units.
Project borders are not defined adequately.
Projects are not prioritised.
Overlapping projects and tasks.
Owner of or the strategy for the portfolio is not specified.
Several organisational bodies are entitled to set up new projects and allocate resources to them: top management, divisions, business units and cross-organisational portfolios. Projects are scattered in the organisation and only little integration exists
Project work is given a second priority. Operational work is given priority over projects. The management does not seem to be committed to reviewing project work. Project work is not rewarded systematically, as is operational work similar to the rewarding
Others
Information flow from projects to the other parts of the organisation, and vice versa, is not defined: 'Who' should be informed, 'when', 'on what', and 'how'. No common database of all projects. It is hard to link projects and identify overlaps in project
Management does not seem to be committed to reviewing project work, especially cross-organisational. Project work is not rewarded systematically, as is operational work. Every unit has its 'own' objectives.
between organisational levels and units.
Unclear roles and responsibilities between the managers deciding on 'Go' decisions and the other parts of the organisation.
The strategy for the portfolio is not defined properly. Personnel strategy is not defined cross-organisationally.
Rapid and recurring changes in roles and responsibilities. Deficient feel of continuity.

ANALYSIS OF PROBLEM AREAS (RESULTS OF STEP 5)

The result of the combination of problems of the survey (Table 1) and the causes produced in the workshops (Table 2) were finally categorised into six relevant problem areas (Figure 2).

The major problems in *project level activities* (Figure 2) were improper implementation of the pre-project phase with regard to many aspects, infrequent project progress monitoring and too long projects that are difficult to plan realistically in detail. In *portfolio level activities* (Figure 2) there were five major problems. First, the projects were overlapping both within one portfolio and between portfolios. Second, the results of the projects were not integrated into each other. Third, there was a lack of critical considerations of portfolio managers when making decisions on projects. The available resources, the value of the project to the portfolio and the priority of the project were not considered properly and no projects were stopped although new projects are all the time added to the list of active projects. Fourth, the roles and the responsibilities of the portfolio level decision makers were not clear or managers had not fully digested them. Fifth, too little feedback was given from the portfolio level back to the project level to guide projects to a right direction. And lastly, there was a reluctance to kill projects. (Figure 2)

In the area of *management of project-oriented business* (Figure 2), project work is often given a second priority and not rewarded equally to the other tasks. Also, an owner or a strategy for the portfolio is not defined clearly or tangibly enough. Furthermore, there are rapid and recurring changes in roles, responsibilities or organisational structure hindering the development of continuity in the project work. Moreover, many organisational levels and bodies are entitled to set up projects, which seems to make the management of multiple projects more challenging. In the field of *information management* (Figure 2), there is generally a lack of transparency in project information and its quality. Information does not flow fluently and the personnel is not clearly informed about when information should be delivered, on

what, to whom, how and in what format. This relates closely to a lack of an appropriate database on project information.

The two last problem areas are '*Commitment, roles and responsibilities*', and '*Resources, competencies and methods*' (Figure 2). The roles and the responsibilities between the portfolio decision makers and the other parts of the organisation are not clear. Also, management does not seem to support project work. In addition, roles are not clear between the steering committee, the project team and the project managers, that is, at the project level. Monitoring of the project progress is infrequent and there are no adequate methods or guidance for portfolio evaluation and project planning and management. On top of that, there is a continuous shortage of resources, lacking commitment to the project work and inadequate competencies to manage a project.

Figure 2. Summary of problems at project and at portfolio levels

CONCLUSIONS

The literature on problems in managing entire multi-project environments with internal development projects is almost non-existent. This paper made an attempt to bring forth some relevant areas in managing portfolios in internal development projects and, consequently, to clarify the important areas

for respective managerial activities. The analysis of the problems with two case portfolios introduced six relevant problem areas. Comparing those empirically-derived problem areas to the problems introduced in the literature encourages us to suggest that the six problem areas resulting from our empirical study would be considered as a relevant starting point for further studies and development of managerial applications:

1. Inadequate portfolio level activities
2. Lacking resources, competencies and methods
3. Lacking commitment, unclear roles and responsibilities
4. Inadequate portfolio level activities
5. Inadequate information management
6. Inadequate management of project-oriented business

The project portfolio management literature recognises similar issues that these areas cover.

Furthermore, the literature introduces *information overflow* and *decision-making basing on power* as two additional issues that are not emphasised in our empirical findings. Our empirical analysis introduced such managerial problem areas that represent a wider scope than what has been seen relevant in existing project portfolio management literature. However, this study limits its empirical findings to only two internal development portfolios in a matrix organisation. The problems found in the two case portfolios were quite similar. This encourages suggestions for further studies that would investigate if similar problems would occur in other organisations, or in other types of portfolios. Future research could identify solution areas and suggest specific solutions for the managerial problems highlighted in this study.

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