

A Review of Project Selection and Project Portfolio Management

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프로젝트 선정 및 프로젝트 포트폴리오 관리에 관한 고찰

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요약

본 연구는 프로젝트 선정 및 포트폴리오 관리에 관한 고찰이다.

첫 번째 부분은 프로젝트 선정에 관한 세 가지 방법 (AHP, 경제학적 방법, Microsoft's Enterprise 프로젝트 관리 방법)의 장·단점에 대한 간단한 견해를 제시하였다. 두 번째 부분은 프로젝트 포트폴리오 관리에 관한 기법 등을 소개하였고, 6개의 질문을 통해 프로젝트 포트폴리오 관리 시스템에 대해 어떻게 조직화하고 활용할 것인가를 고찰하였다.

키워드 : 프로젝트 포트폴리오 관리, AHP, 경제학적 방법, Microsoft's Enterprise 프로젝트 관리 방법, 프로젝트 포트폴리오를 위한 기법

1. Introduction

This paper consists of two parts:

The 1st part provides a brief discussion of three different approaches to project selection with one method that is not described in the text. Also, it considers some of the following approaches as the other noted sources for Internet research: Markowitz and goal-based models, portfolio planning cross plots, rank tables, project roll-ups, and Microsoft's enterprise project management. That is, prepare a

paper that includes the following: a description (format/Structure) of the selection method & an analysis of its advantages and disadvantages at every method (this third option).

The 2nd part (after discussing the three methods of the 1st part) is to look at the tools and techniques for project portfolio management and describe how a project portfolio management system might be implemented in an organization. And consider the following: what type of portfolio management system should this organization set up? / Who should be responsible for the project portfolio management system and why? / What type of tools would you recommend? / How often should this organization review its existing projects to determine whether they should continue to be pursued? / What criteria should

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it use for these decisions? / What guidelines should the organization use to set up the system and to introduce it to the rest of the organization?

2. Three different approaches on project selection

2.1 AHP Method

2.1.1 Description of AHP method

Analytic Hierarchy Process is a decision-aiding method developed by Saaty[7]. It is simple and practical in dealing with the problems that have both qualitative and quantitative traits. This method focuses on calculating the relative weights of various factors. AHP method can form a pairwise comparison matrix for each component in the sub-goal and goal layers. In each matrix, the elements represent the relative importance of the pairs of factors to their common parent component in the decision hierarchy [7].

To avoid inconsistency in the data used in the importance comparison judgment matrix, Saaty [7] proposed the Consistency Ratio (CR) to examine the consistency of a matrix. If the CR value for a matrix is less than 0.1, it is considered to have a good consistency in the calculation of the weights of the factors[8].

2.1.2 Analysis of its Advantages and Disadvantages of AHP method

AHP proposes many advantages as follows[4]:

- Simple procedure: commonly 6-7 steps
- Visual hierarchies: easily can be viewed by Expert Choice software <http://www.expertchoice.com>
- User friendliness: easy access with the tool (Expert Choice software). Refer to the following <Figure 1>.

However, AHP has some disadvantages:

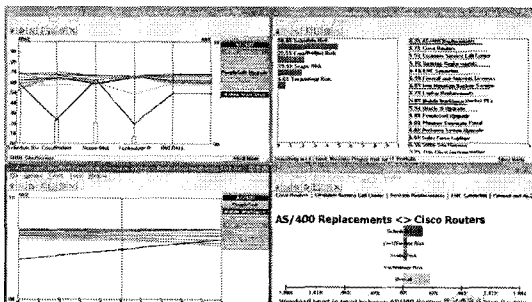
- Subjective nature: Actually we experienced this analysis many times and we think that this point is very important factor. There were no exact guidelines as to how experts were chosen for this analysis and the results may be constructed based on the experts who participated in this analysis. Therefore, it is strongly recommended that a critical process should be required for selecting the experts.
- Complexity: However very simple by virtue of the computerized tool.
- Difficulty: more difficult point is not easy to get an answer of the questionnaire via experts. Because experts also think that, at first, the AHP logic is a little difficulty.

2.2 Economic Methods

2.2.1 Description of Economic Methods

These methods are designed to consider monetary cost and benefit (return) from many projects. Thus, firstly, financial data must be obtained. These methods have 3 types of models: Payback Period (Time), NPV, IRR [4]:

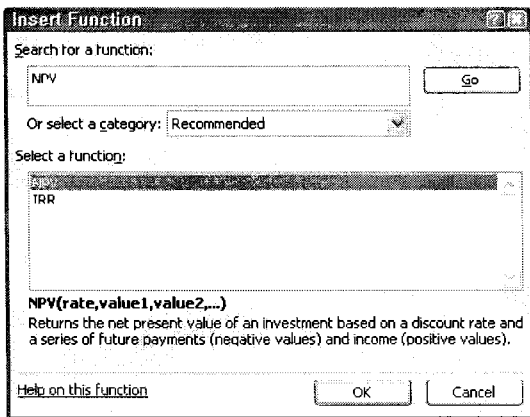
- Payback Period: this model is the most simple and easily used. This is simply the length of time from when the project is initiated until the cumulative cash flow (=benefits-costs) becomes positive (ex, for project 2 in 3 years).
- NPV (Net Present Value): This considers the time value of money. NPV model discounts future costs and revenues by the interest rate.
- IRR (Internal Rate of Return): This also considers the time value of money. This just expresses the NPV cash flow as percentage (%). That is, simply the discount rate at which NPV for the cash flow is Zero.



<Figure 1> Expert Choice software
(source: <http://www.expertchoice.com/>)

2.2.2 Analysis of its Advantages and Disadvantages of Economic Method

These methods can be easily used when there are adequate data. And these methods are readily understandable and can be accessed via MS excel spreadsheet Excel function: NPV, IRR. The following <Figure 2> is an excel spreadsheet view.



<Figure 2> MS excel Function of NPV

However, these methods require data about future costs and benefit (revenue) but benefit estimation is very difficult to process and a little vague.

2.3 Microsoft's Enterprise Project Management

2.3.1 Description of Microsoft's Enterprise Project Management method

Organizations are increasingly managing their activities and processes as projects in a more coordinated approach which creates an improved performance management environment. This environment generates the opportunity for management at all levels to be better driven and support decisions to respond early enough, efficiently and appropriately to deliver their business and personal objectives. So Microsoft's Enterprise Project Management (EPM) has fast become the technology tool of choice for businesses to manage their project portfolios (<http://www.ideas.bh/Services/Consultancy/EnterpriseProject.aspx>).

Microsoft's EPM Solution has collaborative project

and portfolio environment. The Office EPM Solution helps the organization gain visibility, insight, and control across all work. Thus it enhances decision-making, improves alignment with business strategy and maximizes resource utilization (http://www.acctech.biz/microsoft_epm.html).

2.3.2 Analysis of the advantages and disadvantages of Microsoft's enterprise project Management method

The benefits are as follows:

- Better decision-making of project portfolio: Gain insight into the performance of overall portfolio by identifying trends and problem areas using powerful analysis tools.

- Optimize resources across the organization for sustained competence: Better assess resource efficiency and activity across projects by accurately and consistently tracking resource use and workload.

- Streamline project management performance for competitive advantage: Achieve organization-wide compliance and greater efficiencies in project delivery by capturing and deploying best practices and continually improving processes

(<http://www.ideas.bh/Services/Consultancy/EnterpriseProject.aspx>).

However, this solution is very general and has less customized characteristics. Recently Microsoft's EPM has attempted to be more customized in proposed areas (industries or companies) via the M&A of competition product(s).

3. Various Questions related to project portfolio management

Considering the tools and techniques for project portfolio management, what will follow is a description of how one might implement a project portfolio management system in an organization. Also We assume that the organization is moving to a management-by-projects approach. Prior to this time, it had a number of projects under way in different parts of the company. Now it has established an

Enterprise Project Management Office and has realized that projects are strategic assets to the company.

3.1 What type of portfolio management system should this organization set up?

Originally, the logic of portfolio management is that the investment firms are seeking to balance their growth versus income stocks. This organization spread out across industries and departments (ex, IT companies, R&D organization type etc) all in an attempt to acquire a well-diversified portfolio of project and project-driven organizations. By supporting such diversification, portfolio planning tools also facilitate the alignment of projects with the organization's strategy while balancing risks involved in projects [4].

Portfolio management focuses on prioritizing resources and optimizing the business benefit. For example, in the R&D organization, the important task of a business manager may be to increase risk to balance the portfolio of projects for the benefit [5].

Also, enterprise is considered as a complex system that runs and performs a set of projects and includes issues to support and perform project management such as strategy setting, organizational structure, information required for decision making, processes required for project management. Managing individual portfolios below the enterprise level adds value and managing at the enterprise level is optimal.

Thus, the portfolio management of this enterprise includes identifying, prioritizing, authorizing, managing and controlling projects (PMBOK, p.367). And this PMS (portfolio management system) can be set up under the organization achieving the specific strategic business objectives.

3.2 Who should be responsible for the project portfolio management system and why?

The fundamental goals of PPM (Project Portfolio Management) are to shed light on individual elements of a portfolio and to understand how individual projects relate to the overall goals of the enterprise.

Also one of the major benefits of PPM is that it provides the means for project sponsors and stakeholders to benchmark cost savings and business process improvements, during both a project implementation and its post-project audit review process. And project managers' job satisfaction stems from managing available resources efficiently and underbudget in order to deliver quality projects and to satisfy sponsors and stakeholders. The use of PPM can assist the project manager in realizing these goals

(<http://www.pmhut.com/types-of-project-management-communication-project-portfolio-management>).

This organization is moving to Management-by-Projects and has the characteristics of multiple project focus, operating environment, enterprise-wise and strategic issue etc [4].

And so, we think that this strategic concept is apt for Executives level or CEO of group organization.

3.3 What type of tools would you recommend?

There are tools and techniques for Project Portfolio Management and also any organization can optimally use a variety of project selection tools.

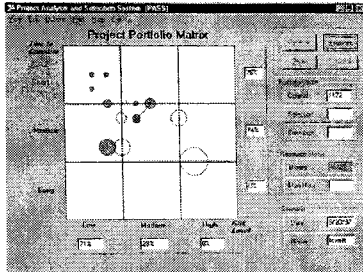
Among these tools, firstly, the organization can consider traditional charts and bubble diagrams for portfolio management.

As the suitable tools of this question, we want to recommend the Bubble Diagrams method. Bubble Diagrams are tools that can be used in multiple ways. One of them is the hierarchical format, beginning on the top strategic projects and cascading through portfolios of different organization levels (ex, marketing or R&D department) all the way down the group level [4].

As another tool, we recommend the AHP method. AHP Methodology helps organizations align their decisions with their strategic business objectives and this method enables the project members to participate in DSS (Decision Support System) and Group DSS via simultaneous AHP tool.

Also, Ghasemzadeh & Archer [2] developed a prototype DSS(Decision Support Systems) called PASS to support decision-makers in project portfolio

selection as shown in <Figure 3>. We think that this software help the organization to get an optimal decision.



<Figure 3> Prototype DSS(Decision Support Systems) called PASS

However, there is no single "right answer" as to how to manage multiple projects, the best software to use, the right organizational structure, or how to properly engage senior managers. What is important is for management to establish a culture that encourages open and honest communication, proactive decision making, accurate documentation, and timely reporting of all project and resource information [1].

In conclusion, the tools that has the highest number of marks is probably the most appropriate to adapt it through the table of text as considering the organization environment [4, p.64 & p.84]

3.4 How often should this organization review its existing projects to determine whether they should continue to be pursued?

The project selection process includes both the list of the existing and newly selected projects [4]. And so, this organization needs to review them and construct the suitable project portfolio management (PPM) when the existing and newly projects always occur.

And managers routinely pose the following questions [6]:

- 1) What projects should the company fund?
- 2) Does the company have the resources to support them?
- 3) Do these projects reinforce future strategic goals?

- 4) Does this project make good business sense?
- 5) Is this project complementary to other company projects?

3.5 What criteria should it use for these decisions?

Project management enables the related methods to activate or deactivate projects using objective criteria.

If the organization uses project scores from project selection, the organization rely on multiple criteria, a good option for this situation is to build a risk-reward Bubble Diagram, in which axes are based on the same scored criteria that were used in the scoring model to rate, rank, and select projects [4]

Managers need to consider as part of any potential project adoption process as follows [3]:

- Is the proposed project consistent with the goals and mission of the organization?
- Does the project portfolio contribute to the organization's strategic objectives?
- How does the proposed project affect the organization's resource constraints?

And for the prioritization task of project portfolio, several criteria may be used:

- Cost/ Opportunity/ Top management/ Risk/ Strategic 'fit'/ Desire for portfolio balance etc

And the decision whether or not to proceed in specific strategic directions is often influenced by market conditions, capital availability, perceived opportunity, and acceptable risk. A variety of project alternatives may be considered reasonable alternatives during portfolio development [6].

Also we think that economic methods (ex, NPV, IRR etc) and AHP method can be suitable for these decisions when the existing and newly projects occur.

3.6 What guidelines should the organization use to set up the system and to introduce it to the rest of the organization?

The keys to success project portfolio management include the creation or availability of a flexible structure and freedom of communication. There are a

number of challenges associated with managing a portfolio of projects, including: 1) conservative technical communities that refuse to support new project initiatives, 2) out-of-sync projects and portfolios in which the projects no longer align with overall strategic portfolio plans [6].

The selection of Project portfolio system needs to consider the following guidelines [4].

- Collect cost and other relevant data on each project
- Identify potential conflicts among the projects
- Identify company policies that might constrain combinations of projects
- Set up the optimization problem
- Identify the optimum portfolio
- Test sensitivity

And the managers should consider the following important issues when evaluating screening models for the project selection in reference [6].

- Realism: An effective model must reflect organizational objectives, including a firm's strategic goals and mission.
- Capability: A model should be flexible enough to respond to changes in the conditions under which projects are carried out.
- Flexibility: The model should be easily modified if trial applications require changes.
- Ease of Use: A model must be simple enough to be used by people in all areas of the organization.
- Cost: The screening model should be cost effective.
- Comparability: The model must be broad enough that it can be applied to multiple projects, and it must support general comparisons of project alternatives.

And we think that Pareto principle (20:80 concepts) also can help the organization to set up the system for more focusing on the principal and important projects.

As the considerable point, in spite of new technological support for these type of portfolio selection, knowledge sharing across organizational boundaries becomes more difficult due to legal, cultural, and virtual management issues [2].

Also this organization spread out across

sub-company or department, all in an attempt to acquire a well-diversified project and project-driven organizations [4].

4. Conclusion

This paper presented a review of the process of project selection and project portfolio management.

First, three different approaches to project selection were looked at and their various advantages and disadvantages were discussed. Although AHP and the economic method are both valid and useful techniques, it appears that Microsoft's Enterprise Project Management method is fast becoming the tool of choice. However, even this method is seen to have its own problems and thus improvement can be further sought.

Secondly the tools and techniques for project portfolio management were considered along with a discussion of how a project portfolio management system may be implemented in an organization using 6 key questions. Though it is clear to see that developments are being made, there were questions and challenges brought up which should be addressed.

In conclusion, portfolio management system can be set up under the organization achieving the specific strategic business objectives. Also this strategic concept is apt for Executives level or CEO of group organization and the software proposed in this paper helps the organization to get an optimal decision. If the organization has an opportunity of project selection, the tools that has the highest number of marks is probably the most appropriate to adapt it through the table of text as considering the organization environment.

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