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## **Efficient Collection Methodology of Projects Balance Strategy Using Software tools in Decision making**

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### **Abstrac**

The improved decision making approach to project selection development by using optimized software tools is present in this paper. The literature exposed a space formed along with lack of establish approach and normative model to develop the selection has reviewed. To connect this space, the topical information and offers techniques for decision making by choice of more suitable project selection is achieved by this works. These techniques could be implemented by using software tools in project selection with some constraints considerations and conformity with commercial policy. The formulation of collection optimization and configuration which reproduce all keys parameters in the used strategy could be founded to success the under hand project. Furthermore, the SMEs environments techniques have been used to implement the suggested method with one case study confirmation feasibility of this advance. The results show that the effectiveness of selection techniques and methodology for project collection has optimized which increase the corporation presentation and saver price. Thus, the utilize of software with right admission to information collection and processing permits administrator to make enhanced decisions for efficient resource.

**Keywords-** Projects Balance Strategy, Software tools, Decision making

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# Metodología de recolección eficiente de proyectos Estrategia de equilibrio Uso de herramientas de software en la toma de decisiones

## Resumen

En este documento se presenta el enfoque mejorado de toma de decisiones para el desarrollo de la selección de proyectos mediante el uso de herramientas de software optimizadas. La literatura expuso un espacio formado junto con la falta de un enfoque establecido y un modelo normativo para desarrollar la selección que ha revisado. Para conectar este espacio, este trabajo logra la información de actualidad y ofrece técnicas para la toma de decisiones mediante la elección de una selección de proyecto más adecuada. Estas técnicas podrían implementarse mediante el uso de herramientas de software en la selección de proyectos con algunas consideraciones de restricciones y conformidad con la política comercial. La formulación de la optimización y configuración de la colección que reproduce todos los parámetros clave en la estrategia utilizada podría ser fundada para el éxito del proyecto en cuestión. Además, las técnicas de entornos de PYME se han utilizado para implementar el método sugerido con la viabilidad de confirmación de un estudio de caso de este avance. Los resultados muestran que la efectividad de las técnicas y metodología de selección para la recolección de proyectos se ha optimizado, lo que aumenta la presentación de la corporación y el precio de ahorro. Por lo tanto, la utilización de software con derecho de admisión a la recopilación y procesamiento de información permite al administrador tomar mejores decisiones para un recurso eficiente.

Palabras clave: estrategia de equilibrio de proyectos, herramientas de software, toma de decisiones

## 1. Introduction

The coordination and controlling of many projects that follows same strategy and participate for the identical resources could be managed by mean of project collections where manager's priority between projects to provide better benefits [1]. To manage multiple projects solve the difference between these projects, the EMs environments could be used as well as define the organization structure and all rules of associated functions [2]. The collection of organization should be containing a balance of project types to provide

optimum value [3]. Depend on the many studies, the collection of project management is apply in perform of all current ventures [4]. To use the methodology of success software, it is important to form an effective collection configuration in order to control project priority and arrange the goals set in fulfilled way [5]. In same time it's necessary to produce a suitable organization structure via entire arrangement and implement the project at correct time with optimum use of resources [6]. International standards like PMBOK, PRINCE1, PRINCE2 and IPMA could be used in project manage processing as international recognize [7]. The environment of Germany is commonly uses the multi project management with complex plan, control and coordination [8]. Based on DIN 69901, multi project management could be defined as an organizational and procedural framework for running more than one project which ranked into the management system [9]. In order to implement more projects at same time within an organization, the multi project management allows this anticipation [10]. This topic has been addressed by many authors such as [11-23]. The project collection development is vital key phases of software environments which provide an optimized output and the implementation is contributed to fulfillment the strategy goals and complies with solid of policy. This demand could meet the collection development process and provide specific requirements in term of content.

## 2. Methodology

The major objectives of this paper are to exploit the financial value of collection and to ensure the balance of projects by limitation of organization capacity. Many techniques could be used to carry the strategy of decision making and resource allocation of future and current projects. The software research perform formulation in two theories, one is an effective project collection development which is necessary precondition to fulfillment the strategy goal and the other is an effective project collection development for meeting the performance parameters of such collection. The more research questions raised are representing by:

- a. What change in SME environment could be made by project collection management
- b. How the project collection could changed by mean of risk exposure changing
- c. How the project collection could developed through this technique and decision making process

In this research, the set of data which is necessary as input to the project collection optimization involve the parameters below:

- a. The value of multi criteria evaluation result in the project
- b. The NPV probability distribution which is determine by Monte Carlo simulation
- c. Investment costs probability distribution which is determine by expert basis
- d. The necessary headcount for each investment project
- e. The optimization of winning for statistic dependence along with investment cost and NPV of each project

### 3. Research Performance

By using the case study model of a pharmaceutical company with 105 workers, the research was performed and investigated in this paper. The total sales of this company are 150 M USD and assets over 150 USD focused on the production of active pharmaceutical ingredients (API). To develop the strategy of this company, a part of which an extensive development programs could be used due to the ability of manage a wide collection savings of original project. The condition of this company to successful implementation in future strategy development is dependent upon many key success factors such as employers and availability of resources with required competency collection, founding of a company information and knowledge base. In combination with company strategy development, the concerning of problem solving and product optimization collection which would maximize the saver value at suitable risk level and respect all predefined restraints. The active pharmaceutical ingredient production is a type of business which specialized in chemical and pharmaceutical commerce overlapping. The API business merges strict narrow requirements which are typically for pharmacy business with technical demands that are relevant to particular in chemical businesses. This paper deals with investment project collection optimization in pharmaceutical company which is work in general API business. The proposed and current product collection is aimed at very complex hormone production based generic medicines. Many problems have faces in this company regarding to the operation of many innovation project in parallel way. The first one is restricted speculation budget, if possible to be used for purchase of new facilities and the second represented by constraints regarding available in house human resources. To develop the technique of testing and technology and validate processing and testing methods, the technical knowledge and skilled of staff shows an important necessary in this case. The company investment managers, directors and external expert's originality who were purposefully involved in this research from profes

sional associations such as chemical industry association of small and medium size enterprises are the main keys of the obtained results. The collection of those persons for ethnographic research could be summarized as follow:

- a. Deep participation in the management of company strategy
- b. Good knowledge in project collection management
- c. Skills in risk management
- d. Resource constraints management

These limitations are nearly impossible as obtained in additional investment through increased dept is either unsafe or too expensive for organization. Likewise, employ extra staff which possesses the required experience in the chemical and pharmaceutical growth of API is out of query. Generally, there is a long lasting shortage of strictly educated expert in this company marketing and specific in house preparation and the pharmaceutical specialists take at least one year and typically further. The management of innovation products collection from the market point of view is another point which could be discussed. The requirement of company by customers is to offer a balance product collection in spite of economic efficiency. For example, if any two companies are aimed at glaucoma treatment, but the acceptability of either medicine between patients differs. A number of patients better tolerate in one company while others is not requested as well. This medicine could not be observed as replacement and customers want the manufacturer to offer some amount of both medicines of which is to be included in collection optimization. This approach is authorized by the owner due to his consideration in balance product collection to be significant stipulation for risk mitigation. The management of improvement projects is complex matter. Research and development in any company tackles the development of new medicine along with generic product. The costly development represented by former is fairly new medicine whose healing effects are based on new standard while the latter refers to generic copies of medicine that's copyright protection has already has terminated. Although, the generic medicine business produces products who is arrangement is known but not easily reproduced in the exact form in possessions and constancy of the original medicines. Corporations use a variety of knowledge to produce products that convene the requirements of both superiority and financial system.

#### 4. Projects Characteristics

Ten projects research have developed by the company under suggested plan, each of which was considered for extending the product collection. The novelty of listed project has balanced and significantly riskier considered. These dangers

were typically of a technical and market nature. Furthermore, these risks of project diverse even personality causes due to their diverse manufacture level and comprehensive customer collections faked unlike level of danger for each alternative project. Table 1 illustrates the set of projects and the not reusable resource volumes counting capital budget illustrated in Table 2 of technicians and workers. In addition, Table 2 contains resource volumes in the event which could like to realize all ten projects. The indications of exceeding value of additional resources need to be obtained for the realization of all ten projects in this plan.

**Table 1: Optimization Parameters of Project Collection**

Project No.	Value	NPV	IC	Technicians	Employees	Savings Decision
1	27	13.655	2.2749	2	1	0/1
2	30	26.900	4.0012	3	1	0/1
3	50	97.443	13.996	3	4	0/1
4	60	225.821	53.662	5	15	0/1
5	25	8.9821	3.9921	2	2	0/1
6	52	29.1452	9.9114	3	2	0/1
7	65	81.2224	9.9221	4	4	0/1
8	85	170.9992	33.882	15	8	0/1
9	55	55.9922	10.924	19	1	0/1
10	40	32.921	7.993	14	1	0/1

**Table 2: The Budge Consumption of Available Resource**

Numbers	Budge	Technicians	Operators
Available	140	45	35
Required	230.924	90	70
Above	80.993	50	30

## 5. Optimization of Project Collection

The optimization in project management needs to pay attention for three constraints in resources factors. The optimization goal is to develop a collection that maximizes NPV upon given constraints such as budge and workers. As shown in Table 1 and Table 2, the resource and their constraints with input data could be used for further processing to optimize the output gain. Hence, ten projects were subjected for suggested optimization which submitted in several strategy variations. According to logic of investment decision making, every project could be chosen into collection in one variant. Furthermore, the company maintained on counting two projects into the collection since, these

projects are in agreement with their global policy. Table 3 shows the summarized results of optimization process. In optimal collection, there are seven projects were included. Random optimization of the investment project collection resulted in a composition of the entire investment collection which has approximately NPV of 545 thousand USD. The risk of optimal collection expressed by standard deviation is 40 thousand USD. According to assumptions, no variant of project could be incorporated in the project collection. There are two compulsory project is necessary by the company to be represented in the collection are built-in. Hence, the resource constraints are concerned and the investment budgets to be paid for the completion of the optimal collection sum of 120 thousand USD. Therefore, the remnants monetary keep amounting to 20 thousand USD to cover up unpredicted extremes in the capital budge. The IC represents the expected value of investment costs that could be predictable. For human resources constraints, specific under technicians and employees to be obtainable, the optimization collection works with 45 technicians out of total of 48 and 30 workers out of 36.

Table 3: optimization parameters of collection

Collection Structure	Value	NPV	IC	Technicians	Operators
2,4,8,10	440	545.226	120	45	30

Here there is little reserve in staffing projects, one redundant worker in all technicians and employees group has chosen for collection which could be used as emergency measurement. The whole project collection chosen was 440. As a part of collection NPV, maximize value was not selected as the key principle for collection chosen since it is not random value. This idea serves as supportive principle. Hence, in case of company wants to provide a collection with more value, the addition requirements for achievement of sure base limit value of collection with 475 into the set of constraints is important. Extra increasing in value results in decreasing of NPV. Through next investment decision making process, management should trade off among value and NPV. Likelihood allocation of project collection of NPV is illustrated in Figure 1.

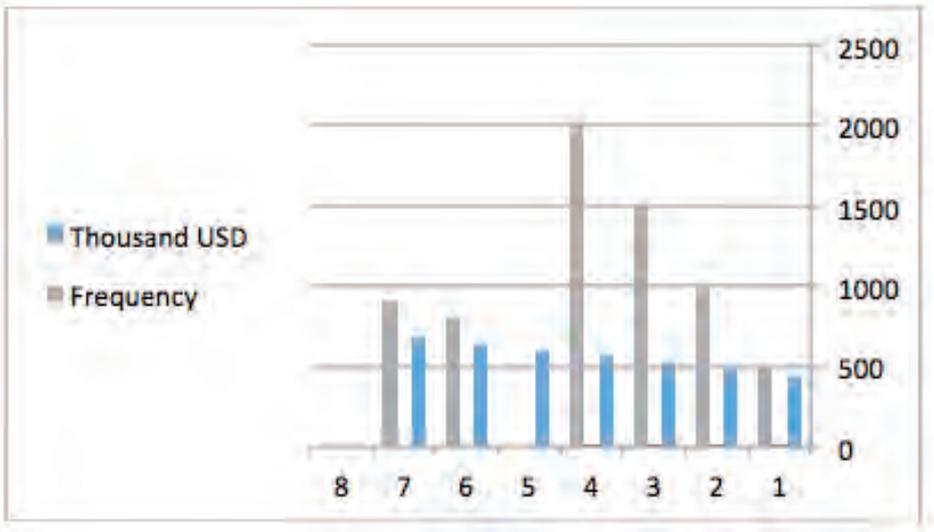


Figure 1: likelihood allocation of project collection NPV source

The theoretical allocation that fits well in calculation allocation is logistic process. There is 90% surely that NPV of optimize project collection will be larger than 475 thousand USD as clearly shown in Figure 1 and this will produce viewpoint risks. One more task deal with optimization, it's the finding of an efficient boundary of collection in the risk which determine by maximization of NPV inside collection by increasing the higher limit of risk measured by standard divergence. In spite of the reality that the standard deviation of best collection is 45 thousand, the minimum limit of risk was chosen in terms of standards deviation of 20 thousand and the upper limit up to 60 thousand. The first efficient collection with NPV is approximately 400 thousand and standard deviation is 23 with the value of 530 as illustrated in table 4.

Table 4: the most efficient boundary

Effective Boundary	Collection structure	NPV	Value	IC	Technicians	Operators
1	2,3,7,9,10	390.99	530	90.99	40	30
2	2,3,6,8,9	440.98	490	100.0	45	30
3	2,3,6,8,9	440.98	490	100.0	45	30
4	2,3,6, 8,9	440.98	490	100.0	45	30
5	2,4,7,8,9	510.26	480	114.0	43	35
6	2,4,8,9,10	550.00	450	125.0	45	35
7	2,4,8,9,10	550.00	450	125.0	45	35
8	2,4,8,9,10	550.00	450	125.0	45	35

The optimization of second run one could determine the upper limit of risk by 30 thousand and the subsequently six, optimization sustained by steadily increasing the upper limit of risk by 5 thousand up to 60 thousand. Figure 2 shows the results of efficient boundary calculation from Table 4.

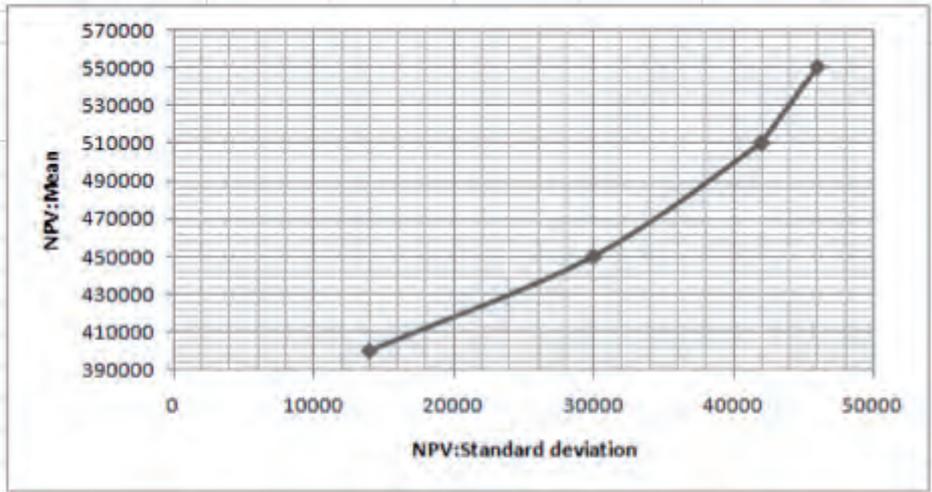


Figure 2: Efficient determination of boundary

Evidently, the NPV rise in consonance with increasing the upper limit of risk by using standard deviation and this dependence is not balanced. This change in risk level is not constantly happened in the new generation of collection with high level of NPV. In spite of eight successive change happened in collection risk, four collection was developed only as in 1, 2, 3, 4, 5, 6, 7, 8. In this case, the situation will approach into the result when no enhanced collection could be improved. Hence, by using random optimization in project collection is importance consideration even for medium and small activity size. This will supports the investment investigation risk in package of projects that are applicants for investment collection on definite constraints. The suggested approach enables intersecting investment decision making with situation of approach and endorses investment decision making in order to provide high valued techniques. The optimum selection of project collection could provide better performance by using stochastic distribution depending upon the variety of constraints. This selection will produce project funding and staffing with compulsory projects compare with other project in the market. The optimization offers better probability distribution of NPV in the optimal collection which gives competent boundary determination.

## 6. Results Discussion

The methodology was suggested includes elements of operational research and strategy of decision making. The strategic stage consists of collection composition and choice of applicable collection. The below parameters belong to main goals of project collection management is:

- a. Project selection introduce high benefits
- b. Project prioritizing within collection
- c. Risk managing within collection
- d. Pre set resource respecting limitations

Clearly, the strategy procedures are often used in the beginning of decision making stage of project assortment. After that, many various methods such as mathematical programming were applied in the stages of projects that follow by previous studies. The rigid selection is dynamic in the high sophisticated pharmaceutical business that possesses limited resources of expert are not easy grow in the time obtainable for project collection reformation. The fractional project favorites should be considered as early as basic collection is creature collected. An efficient selection of collection was essential for the competitive advantage and value creation of the compact. The flexibility of innovation project collection with partial resources was expected for strategy realization. The strategy of precedence is strongly prejudiced by developing the environments requirements that's why management should have high experience in management policy. The European industrial research management is explained as below:

- a. Costs mainly concern the staff time should spend in realizing the selection techniques and projects selection.
- b. The project selection should be geared in the direction of the methods that meet best decision making requirements.
- c. The features of strategy are difficult of monetize.

The software programs used are appropriate for both research reason and realistic use in SMEs Company. A convinced shortcoming of the software programming is that not allow collection optimization with deterministic criterion. Meaning that, the entire case study optimization of collection values is provided. The income is simple to understand and symbolize adequate environment for making manage decision of such meaning. Though, split decision-making cannot be completed only on the basis of computer simula

tions and optimal results. Typically of a qualitative quality must be keeping into account. For successful realization of selected project collection, other requirement should be achieved such as capability of staffing in the project management. The modification in projects collection could be important to optimize the collection and costume stakeholders.

## 7. Conclusions

This paper presents the efficient methodology of project collection control policy by using SMEs environments in decision making techniques. According to this objective, the presented method was applied in software manners. This methodology becomes better process innovation to manage any company investments which was executed in collaboration with rigid management. Provided the efficient managers will support clearly and convincing to give details of their cases for making decision to stakeholder. The output quantitative of the simulation was presently adopted by the company management as internal policy objective for collection administration. The company managers was evaluated this methodology as a obliging tool to improve strategic management in the compact root. The suggested case study built-in joint complication and difficulties associated with the project collection improvement. The simulation results show an optimization of project collection problems and maximization of the collection NPV as well as setting an effective collection boundary. Project selection for collection was determined using financial budget and employers. The input data of project collection optimization is prepared by multi criteria values, NPV probability distribution, investment cost for each project and headcount were resolute.

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