

Project Objective Structure Model: An Integrated, Systematic and Balanced Approach in Order to Achieve Project Objectives

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Abstract—The purpose of the article is to describe project objective structure (POS) concept that was developed on research activities and experiences about project management, Balanced Scorecard (BSC) and European Foundation Quality Management Excellence Model (EFQM Excellence Model). Furthermore, this paper tries to define a balanced, systematic, and integrated measurement approach to meet project objectives and project strategic goals based on a process-oriented model. In this paper, POS is suggested in order to measure project performance in the project life cycle. After using the POS model, the project manager can ensure in order to achieve the project objectives on the project charter. This concept can help project managers to implement integrated and balanced monitoring and control project work.

Keywords—Project objectives, project performance management, PMBOK, key performance indicators, integration management.

I. INTRODUCTION

PROJECT managers must define “how the project fits into or supports the company’s strategic goals?” and “how the project manager ensures the project meets project objectives and will be successful?” [1]. Usually project performance system includes cost/time performance indicators. For example, there are S-Curve and earned values. Based on PMBOK definition, earned value analysis in its various forms is the most commonly used method of performance measurement. Indeed, usually, the performance of project can be found if it is on budget and on schedule with acceptable level of quality. However, it seems that there are other factors in measuring project performance. That requires more focus. The project manager with the project team needs to address every process and the project environment to define the level of implementation for all processes within the project. Each stage in a project must be dealt with its appropriate level of hardness, if the project is associated with multiple stages [1]. The project manager and project team also address this determination.

It is essential to consider “Project Integration Management” where distinct processes need to connect and communicate [1]. For example, developing a contingency plan to estimate project’s cost requires considering “Project Cost, Time, and Risk Management Knowledge Areas” simultaneously [1]. When extra risks associated with various staffing alternatives are identified, then one or more of those processes may be

reviewed. The project goals may be required to be synced with ongoing procedures at involved organizations, such as “the performing organization, the requesting organization” and also with the long-term plans that predict upcoming complications and opportunities [1]. Some actions are needed to control project documents and to keep consistency with project management plan, objectives and product, service, or capability deliverables. “Project Integration Management” includes these actions and activities [1].

Most experienced project management experts know that there is no single way to manage a project. They use project management knowledge, skills, and required processes in a preferred order and with varying difficulty to accomplish the needed project performance. However, this does not mean that a certain process should not be reflected upon, if it is not necessary [1].

Projects and management are “integrative” in essence [1]. To be able to understand this, one must think of other kinds of activities completed in the process of a project. Some examples of management teams’ general duties are [1]:

- ❖ “Develop, assess, analyze, and understand the scope” [1]. The scope is defined as product or services requirements, criteria, assumptions, constraints and other. In addition, the process of dealing with these issues or meeting the goals must be understood by the team.
- ❖ Convert the collected project information into a project management plan using a structured approach as described in the PMBOK® Guide;
- ❖ Perform activities to produce project deliverables; and
- ❖ Measure, monitor and control the project’s progress and take proper action to meet project objectives. One of the duties of the project manager is to make sure that the project is effectively and efficiently progressing towards the defined organization objectives and the requirements of a “broad set of stakeholders, as defined in the business case” [1]. Project managers should acquire skills to identify, build, maintain, motivate, coach, lead, and inspire project teams to achieve high team performance and to meet the project’s objectives. Therefore, project managers need a tool to help them to ensure project success.

On the other hand, project management plan documents the strategy and processes for managing the project, “related to the knowledge areas of scope, schedule, cost, quality, human resources, communication, risk, procurement and stakeholder’s management” [1]. The project management plan is an effective way to determine how to plan, perform,

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monitor, check and correct, and finish a project. The content of the project management plan can differ when applied to diverse areas or various levels of project difficulty [1]. Developing this plan consists of integrating processes and activities well until the end of the project. If developing this plan is done correctly, it will include progress updates and it is continuously monitored, controlled and approved through the “Perform Integrated Change Control Process” [1]. For example, if it is defined in the project management plan that all changes that cost more than a certain threshold must be revised by the “Change Control Board (CCB)”, then the process of revising and the cost threshold should be included in the project management plan [1]. In the other words, project management plan defines enablers to ensure consistent results. When creating a management plan, the project manager asks, “How will I define integrated plan, execute and control those knowledge areas in the project?” Upon completion of the project, the project manager reviews information from each earlier phase completions, to check that all project work is finished, and all objectives have been met [1]. Before declaring that the project is closed, the project manager evaluates the scope baseline. This is necessary because “project scope is measured against the project management

plan” [1]. When a project is closed before completion, the reasons and the actions taken towards closing it are investigated and documented. The procedures on how to do this are determined in “The Close Project or Phase” process [1]. The project manager needs to engage all the appropriate stakeholders in the process to be able to successfully achieve an early closure [1]. In this definition, something is missing. We have an integrated plan, but we do not have any integrated and balanced measurement system to achieve results. In this context, results are defined as detailed project objectives. Therefore, the creation of POS is an integral part of a project manager’s job, because a project manager needs to have a balance dashboard to manage the project and ensure success.

POS model is defined as a set of measurements that give top managers a fast, but comprehensive view of the project objectives including tangible measures on PMBOK knowledge areas. Nowadays, project managers need to view performance in several areas simultaneously. POS Model does this by providing information from nine perspectives: scope, time, cost, quality, human resource, communication, risk, procurement and stakeholders. This concept helps to implement integration management in PMBOK.



Fig. 1 The mental model of POS

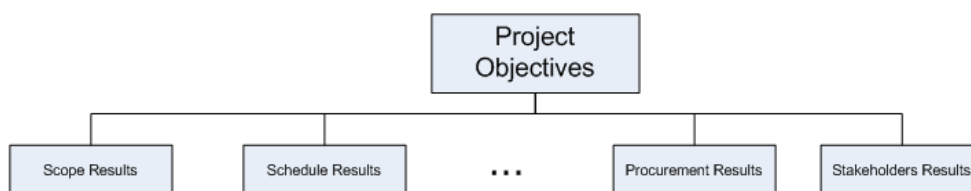


Fig. 2 Hierarchical model of results

II. CONCEPT OF POS MODEL

The Monitoring and Controlling Process Group must have interacted with the other Process Groups. Also Monitoring and Controlling processes implement with the other Process Groups at the same time [1].

Monitoring and controlling process groups are used to measure the performance of the project against the its actual performance in two categories:

- ❖ **Scope, schedule and cost baselines:** baselines are used to compare the project's actual performance against its planned performance.
- ❖ **Project management plan:** measure project performance according to the planned measures in the project management plan.

There are some items in project objectives that are not considered in the above mentioned categories. Which ones have to be considered? These items have to be proportional to project objectives. In order to measure if a project is successful or not, we must define some variables according to the project objectives. In total, there are a lot of variables that are effective and important. We need to categorize those variables in knowledge areas based on the mental model of POS as is shown in Fig. 1 [3]. As a result, Fig. 1 depicts an integration system between enablers (knowledge areas) and results (project objectives) [2]. Therefore, for each result of nine knowledge areas, we define some variables that determine two aspects. Those items measure success level of project according to the project objectives and knowledge areas results. A hierarchical variable model is shown in Fig. 2; this figure depicts an integration and balance system between project objectives and nine knowledge areas. Thus, there are integrated and balanced Hierarchical model to measure project performance to achieve project objectives.

There are nine result areas (scope, time, cost, quality, human resource, communication, risk, procurement and stakeholder), shown on the right-hand side of the POS Model (Fig. 1). These are the results that the project tries to achieve, in line with their project high level goals (project objectives). In all nine results areas, we find that Success projects [3], [4]:

- ❖ Develop a set of variables (performance indicators) and related outcomes to determine the successful deployment of their goal, based on the project objectives.
- ❖ Set clear targets for results, based on the project objectives.
- ❖ Segment performance indicators to know the performance of specific areas of the project and project objectives and ensure project success.
- ❖ Demonstrate positive or sustained good results.
- ❖ Determine causes, reasons and drivers of observed trends and the impact these indicators will have on other performance indicators and related outcomes.
- ❖ Have confidence in their future project success and indicators based on their understanding of the cause and effect relationships established with processes.
- ❖ Know how their key performance indicators compare to

similar projects and use this data, where relevant, for target setting.

We must prepare data banks for performance indicators and update actual data periodically. To do this, we need the table, which depicts performance indicators identification. Filling that table helps to gather and analyze performance data used to prepare performance dashboard.

Similar to risk owners in the risk management, we need measurement owners [1]. An owner helps ensure that measurements are right and on time. Assigning team members to manage POS model also helps free up the project managers' time. POS also helps to balance stakeholders' requirements. Balancing stakeholders' requirements is an important aspect of collecting the requirements process [5]. Part of balancing stakeholders' requirements involves making sure that the requirements can be met within the project objectives. In the other words, if we define and measure balanced project objectives, we can balance stakeholders' requirements. In this regard, like requirements traceability matrix, project managers need a method to create a measurement system to achieve project objectives.

In order to understand the POS model clearer, it was implemented on an EPC project and the results were analyzed. Project objectives were clearly described and developed, also the best alternative to satisfy the project requirements was defined. Collecting Requirements is the process of determining, documenting and managing stakeholder needs and meet project objectives. Afterward, in initiating phase, project charter was prepared based on PMBOK. The project charter establishes the relationship between performance and objectives of the organization. In other words, chartering a project specifies the alignment between project strategy and ongoing progress. It documents the business needs, assumptions, constraints, understanding of the customer's needs and high-level requirements and objectives of the new product, service, or result that it is intended for the project. Finally, an important aspect of project charter is measurable project elements and related success criteria. Accordingly, in project charter of the project sample, measurable project objectives were developed. The project objectives were as follows:

- ❖ Create and maintain client's trust for the company
- ❖ Create client's vision to company as a qualified organization
- ❖ Effective cost management
- ❖ Reduce the project delays
- ❖ Effective scope management
- ❖ Attempt to use contract capacities
- ❖ Human capital management
- ❖ Communicate clearly with stakeholders
- ❖ Effective risk management
- ❖ Effective delivery process
- ❖ Acquire experience for future projects while managing this project

TABLE I
PATTERN PROJECT PERFORMANCE INDICATORS TABLE

No.	Knowledge Area	Performance Indicator (Variable)	Project Objective	Measurement Owner	Actual	Target	Similar Project	Cause and Effect
1	Stakeholders management	Client satisfaction percentage	Creating trust in the client	Sales Department		90%		
2	Quality management	Percentage of quality conformity relative to the total	Client's vision of the company as a qualifying company	Project Department		95%		
3	Cost management	Project gross profit	Effective cost management	Financial Department		8%		
4	Cost management	Cost performance index (CPI)	Effective cost management	Financial Department		0.95		
5	Time management	Schedule performance index (SPI)	Reduce the project delays	PMO		0.95		
6	Scope management	SPI×CPI	Effective scope management	Project Department		0.95		
7	Scope management	Final amount of the contract divided by the initial amount of the contract	Efforts to use contract capacities	Project Department		1.35		
8	Human resource management	human capital satisfaction percentage	Human capital management	Human resource Department		90%		
9	Stakeholders management	Percentage of client Satisfaction of the Effectiveness of Communication Channels	Good communication with stakeholders	Sales Department		90%		
10	Risk management	SPI×CPI	Effective risk management	Project Department		0.95		
11	Procurement management	Procurement SPI × Procurement CPI	Effective delivery process	Procurement Department		0.95		
12	Scope management	SPI×CPI	Good project management experience	Project Department		0.95		

In the last step, the measurement index (performance indicator) and target for results based on the project objective were defined for each project objective. Depending on the nature of the project, one may need to define more than one measurement index for every project objective. For example, gross profit and cost performance index (CPI) were determined for cost management in the project objective. In addition, we must assign each measurement index to a PMBOK knowledge area. As said briefly before, for the pattern project, measurement indexes and targets can be categorized as follows:

- ❖ **Create client's trust:** here, related knowledge area is the stakeholders management, and measurement index is the client satisfaction based on questionnaire. Target is 90% client satisfaction.
- ❖ **Create client's vision of the company as a qualifying company:** related knowledge area is the quality management, and measurement index is the percentage of quality conformity relative to the total. Target is 95%.
- ❖ **Effective cost management:** related knowledge area is the cost management and measurement indexes are project gross profit and cost performance index (CPI). Targets for gross profit and CPI are 8% and 0.95, respectively.
- ❖ **Reduce the project delays:** related knowledge area is the time management, and measurement index is the schedule performance index (SPI). Target is 0.95.
- ❖ **Effective scope management:** related knowledge area is the scope management, and measurement index is SPI×CPI. Target is 0.95.
- ❖ **Efforts to use contract capacities:** related knowledge area is the scope management, and measurement index is the final amount of the contract divided by the initial

amount of the contract. Target is 1.35.

- ❖ **Human capital management:** related knowledge area is the human resource management, and measurement index is the human capital satisfaction percentage based on questionnaire. Target is 90% human capital satisfaction.
- ❖ **Good communication with stakeholders:** related knowledge area is the stakeholders management, and measurement index is the client Satisfaction of the Effectiveness of Communication Channels based on questionnaire. Target is 90% client satisfaction.
- ❖ **Effective risk management:** related knowledge area is the risk management, and measurement index is the SPI×CPI. Target is 0.95.
- ❖ **Effective delivery process:** related knowledge area is the procurement management, and measurement index is the procurement SPI × procurement CPI. Target is 0.95.
- ❖ **Good project management experience in this project for use in future projects:** related knowledge area is the scope management, and measurement index is SPI×CPI. Target is 0.95.

While paying close attention to the measurement indexes, the project manager fills the table periodically. The result is shown in Table I. As one can see, performance indicators are defined in accordance to project objectives and PMBOK knowledge area. Measurement owner and target are defined for each project objective. Table I shows the process of filling the table and measuring periodically according to systematic and process-oriented method.

III. CONCLUSION

As mentioned above explanations, the project manager is responsible for ensuring that the project effectively and

efficiently meets the goals of the organization, project objectives and those requirements of a broad set of stakeholders, as defined in the project charter. Therefore, the project manager needs to have practical tools to achieve and ensure project goals and project objectives. In this regard, project management team implements POS model in the following steps:

- 1- Develop project objectives in project charter
- 2- Define measurement indexes (performance indicators) to meet each objective
- 3- Assign measurement indexes (performance indicators) to knowledge areas
- 4- Assign measurement owner for each performance indicators
- 5- Analyze cause and effect according to knowledge areas
- 6- Set target on similar project data
- 7- Complete performance indicators table
- 8- Measure performance indicators occasionally
- 9- Prepare updated performance dashboard
- 10- Implement PDCA cycle according to performance data

Like the EFQM Excellence Model [3] and The BSC Method [2] based on PMBOK, if we use “project objectives structure model”, we can achieve project objectives with balance and integration model, and we can prepare performance dashboard for project managers. By this model, we develop a system for gathering and analyzing project performance data in the project objectives structure and prepare project dashboard for project managers. Lord Kelvin:

“I often say that when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind.”

If something cannot be measured, it cannot be improved [2].

Project managers can use POS model to ensure project success; they can show data and evidence so they can improve processes by PDCA cycle. One can implement this model on the projects and can check POS model, think about the model and develop it in a new and innovative way.

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