"A Study of Multiple Value Measures Applied into Strategic Project Management"

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Introduction

What contents on "project management" would you mean? Generally speaking, "project management" is often used as usual management words in any situations of the business works and also even managers often use this word on any business cases without knowing the exact meaning of project. Here, we try to define "project management" as "process management to realize a certain goals and missions under a certain condition of finite period, specific tasks and certain resource constraints". The example of this project management is recognized in several kinds of assignments in a firm. Generally, specific individual business affairs are recognized as "projects" in engineering or construction business. However, today's projects are recognized as more enlarged concepts which include complex management affairs to realize the specific missions or values. The former definition of "project" is recognized as the first generation of project's concept and the latter definition of "project" is recognized as the second or the third concepts. We shall use a word of "project" in the latter concepts in this paper.

We think the new significant meaning for "project management" is assigned in this business world. If we try to grasp several kinds of enterprise problems as some projects, we could solve such enterprise problems effectively. For example, it would be necessary for us to solve the problem between enterprises as a kind of project. Secondly, the framework of project management would be useful for realizing corporate strategy. Thirdly, a project management would be useful for solving the complex problems to realize a kind of social significance.

Thus, we have two objectives on this paper. First is to make clear the significance of modern project management. Second is to show the contribution of management accounting on this modern project management.

1. The function of management accounting in a project management

We try to discuss the function of management accounting concerned with project management. In this paper we should insist that a management accounting has a kind of the linkage role between management strategy and operation management. This
function has two sides. One of these functions is to translate management strategy into a concrete action or a series of actions if a management strategy would be recognized as a kind of business concept. This function is the breakdown of a strategy into series of actions, and we think a kind of project concept and value indicator is very important for this translating process. This planning and development of value indicators should be done in management accounting. One another function of management accounting is a feedback process from the results of operations into strategic process. For making such management accounting function to be effective, we must define what “an operation” is, we consider “an operation” to be an operational control of line activities.

We would look back into old management accounting topics to be related with project management by means of textbook or cases (R.N.Anthony, 1965), we think there was strong relationship between them in a series of various phases. The typical examples are to be called as PPBS (Planning Programming and Budgeting Systems) and Capital Budgeting, which is applied into management accounting as an evaluation among several exclusive projects or a kind of ordering between them (Bierman, Harold and Seymour Smidt, 1984).

In these days, management accountants and researchers try to do some researches of programs or projects as important planning tools which are connected with budgetary planning (R.A.Anthony and Vijay Govindarajan, Chap. 7, 2001). Also, one trend on a lately strategic management is said to be a resourced based view approach (Andrews, K., 1991). Strategic superior management is to focus into “which kinds of cooperation or alliances between some organizations with a core competitive should be built up? “And “How to make a project” is discussed in such context (Farok J.Contractor and Peter Lorange, 2002).

In this paper, we try to discuss both the function of management accounting concerned with the transferring phase of strategic planning into strategic projects and also of such strategic project into operation process. Thus, the first feedback loop of operational process into project planning phase or an open feedback loop from operational process into strategic planning is not discussed and we try to focus into such two kinds of feed forward process.

2. Project management and PBSC

The significance of management accounting is a linkage function between management strategy and operational planning or operational control process. A strategic plan is a plan by means of top management or executives' initiatives and to make it into practice, series of scenario or concrete means must be prepared or be linked
into such strategic plans. As some operation for making a plan into practice is a diverse activity, some evaluation on which such operation activities will realize some value creations must be prepared. Thus, a specific project choice among alternative projects must be done and management methodology through management accounting for some evaluation on some strategic projects should be necessary at the middle between an operation process and a strategy formulation.

This is shown in the figure 1-1 as a management accounting function where a strategy is developed into strategic evaluation measures. Let us call this to be as “Strategic Program and Project Balanced Scorecard”. Another one of management accounting’s function is to be an evaluation on some specific projects through a choice of a specific scenario and project formulation.

Figure 1-1 Management Strategy and Value Management

(K.Futagami(1984), p.34 and some modified)
This PBSC is to make clear strategic value measures and this role for strategic process is "what kind of means should be choused to realize a strategy in advance and, what kind of value should be realized or not and finally to evaluate a project relevance for a goal or mission. Thus, we are not to evaluate a project or means in advance by means of accounting measures but, to evaluate some projects with multiple value measures. According to the figure1·1 above, firstly we use a SWOT analysis and we try to make a concrete action plans, necessary resource and ability planning, and to introduce necessary KPI (Key Performance Indicators). We try to introduce strategic KPI which is necessary for making a strategic program or projects into arrangement on this strategic planning phase. This PBSC is to develop some strategic plan into a kind of scenario on the fourth dimensions. It is similar to strategic management tools which are insisted by Kaplan and Norton as balances scorecard. But, the function of PBSC is very different with Kaplan and Norton's BSC. The function of our strategic PBSC is to make an evaluation "strategic program" from the multiple value perspectives into do a strategy implementation and it is a methodology for doing a development of strategic projects. Thus, four measures, which mean financial measures, customer's measures, process measures and knowledge measures is applied into a specific program. Through applying Program-BSC into program evaluation, some projects or programs are broached and after that, some specific projects, which are broken down from a program are also evaluated by project-BSC. Finally such projects and program are translated into project-based budget and business unit budget is associated with such project budgets.

3. Three generations of Project Management

We already indicated there were several definitions about project management. A transition about a definition of "project management" is explained by several researchers (S.Ohara(2002),Y.Shibao(2003)). According to their explanations about such transition of project management, there are three generations in project management. The first generation of Project management was done from 1940s to 1960s and the typical example of such project management was a large scale project management in which we could indicate Manhattan Project and Apollo Project. The main theme of such project management is to realize the specific performance by a definite date under some specific quality and specific delivery date. Project managers must manage project cycle of planning, implementation and seeing for realizing such specialized targets. The main
goals of project managers is to do quality management, cost management and delivery management and managers for each project must build a project organization and do progress management with controlling some risks (manufacturing risk and resource consumptions) under a definite level. The representative means for project management is called to be “earned value systems”. Also, work breakdown method (WBS) was developed as a smoothing task progress method. Summing up a first generation of project management, we can indicate the following eight points, (1) task process management, (2) field conscious management, (3) the appointed date of delivery management, (4) technology conscious management, (5) a management on neglecting the mission of a project, (6) a job order production type management, (7) a management with neglecting strategy, (8) a management with neglecting project values.

The most important problems for first generation of project managements are “a project management with neglecting project values”. This type of project management is managed by managers who are from engineering. They are not committed into the management significance or management goals from project management. Thus, the task of project managers is faithfully to realize the work assigned from top management. This type of project management is applied into a various kind of business, for example plant engineering and government sponsored large scale facility buildings and the methodology of “a project management” is transferred into various enterprise activities and business activities except for plant engineering around 1970 to 1980. The main customer for a project management is changed into Information technology business from military business or engineering business. The typical example of “a project management” methodology was a guide book of “a project management” which means PMBOK (Project Management Body of Knowledge) to be published in 1987 and it was published in 1987. The revised one of a kind of knowledge standard was published in 1996 and its additional revision was done in 2000. This knowledge standard was consisted of nine areas of knowledge sets and there are two kinds of characteristics which are “an integration management” area and “individual management” area.¹

The main characteristics of PMBOK are “to obtain an expected performance in consistence with stakeholder needs with considering operational process”. This knowledge body along “Business Process Reengineering” was paid attention to by

information technology business people who wanted to promote business speed or productivities with satisfying a customer needs. A typical case with using this methodology was done by Boeing Aerospace Company to develop Boeing triple sevens jet-plane. Hearing from a manager of Boeing, they used new cost management methodology, ABC and ABM for cost management in this new project management. The changed management style in assembly organization from a functional management to process management. This process management is consistent with "a thought of Project Management (PM)".

However, the second generation's PM would not be enough as a methodology to solve more complex management problems. When some projects are complicity interrelated each other, and we must look at the totality of some projects, we must consider strategic problems and business values, this second generation of PM may not have such strategic point of view and there might be some differences between engineering management and strategic management. For example, we could not consider program management or value management except for earned value management.

Let us look at the third generation of "Project Management". This methodology is to have there are three characteristics that are main factors of "Integration Management". The first is "Project Life-cycle Management" and the second is "Value Management" that must be consider in advance for project implementation. The third is a methodology of dealing with complex problems, and this is called as "Program Management". This body of knowledge is announced in 1992 with a support of Ministry of Economic and Industry of Japan as "P2M" and this standard is managed by PMCC (Project Management Certification Center).

The main value of this third generation of PM is to realize business value or enterprise value through PM rather than reaching task's problem solving and satisfying stakeholder needs. A number of companies in these days are to need PM activities for enterprise value realization and the third generation of PM is thought to be necessary for managers and employees of a company to do a co-operative work for value creations.

Thus, we consider a management accounting's role under the value creation through a third generation of project management. This new role is a kid of linkage between business strategy and business operations.

2 The one of third generation PM is made in Japan as "P2M(Program and Project Management)©"in 2002. The main contributions of this methodology are on "program management, value management and life cycle management process".
4. Program Management

Figure 2-1 Single PM to complex PM

The one of main characteristics of third PM is to focus multiple project managements from single project management. This is shown in Figure 2-1 above and it shows the transformation of PM which means complex managements from single PM and also this PM is a problem solving approach by simplifying a more complex problem with organic integration of multiple projects and with looking at designing business value rather than designing business. This is called as program management here. The main differences between program management and project management (management for single project) are discrimination between designing business and designing with value creation. A single PM is to obtain a result through implementing an individual or a specific process and complex PM is to realize a value or mission through total project's results under a series of projects to achieve specified objectives.

This division is relative and considering designing business, we must naturally
regard a value to be produced. However, under the second or first generation of PM a value management is only done by executive managers as strategic formulation process and a field manager of PM is not related to such process and such goals are assigned by executive managers. However, when we consider a program management, a leader of program management need to think project's value along a basic mission of such program at first time, and put the ordering among multiple projects. In other words, as we call program management to be a third generation, this PM has a significance that it goes to sublimation from engineering technology to management technology.

For example, a firm must change his business domain because of his environment to be already changed so much. If the firm could not change his business domain, he must face his default no later than five years from now. Most of employees who belong to be R&D, production, finance, human resource, and marketing department would share such high risk. But, there is no sharing of how to overcome such risk between them. They know the need of making a transformation project with cross-functional teams. But, what order they set up a series of project and what project we should start from? Evolutionary CEOs tries to make a following scenario and strategic program. First of all, Listing up their own business problems and setting up new business vision against today's environment and threat, they try to stop now useless activities. After such series of action, they keep or collect necessary resource to build new business design and try to transfer new business design into action by means of project management. Of course, any of top managements consider such scenario. But, making a kind of scheduling of such business design and producing a large strategic trend are very important. However, most of top management could consider a strategic project, there are very few of strategic trend of large scale projects to be produced, which includes at first extracting an important issue, setting up concrete vision, making a concrete new business design and making a strategy map for arranging multiple projects as a program.\textsuperscript{3}

5. An introduction of Value Management

The necessary issue will be to introduce value management for developing program management explained above. What kind of value would we produce by projects? We

\textsuperscript{3} In Japan, Nissan is known to be made a number of strategic project by some CEO before Karlos Goone who took over it. However, such projects were not succeeded and only he made it with program management philosophy under strong business commitment.
need a value-based evaluation phase with strategy and mission management for a
bundle of projects at an ex-ante, on a process, and at an ex-post of project management.
This issue depends on introduction of management accounting into program
management. We already indicate the position of management accounting in this paper,
and once again "the linkage function between business strategy and operation process"
is necessary for program management. This linkage is equal to the application of BSC,
which are issued by R.Kaplan and K.Norton into "program and project management".
We can consider there are two types of applications of BSC. The first of BSC is a
function as program value indicators exhibited at the figure 1-1. The second is a
function ad project value indicator. We try to explain them a little more.
Basic BSC which are proposed by R.Kaplan and D.Norton is an extension of
performance evaluation measures into today's business environment. Their BSC is
developed from such performance measures into one to support management cycle and
into a strategic communication tools for supporting strategic (T.Morisawa(2001)).
However, according to his theory, there is not so much clear relationship about the
breakdown from strategic plans with performances measures into operational control
process in financial planning phase. Although multiple performance evaluation
measures on plan and policy of top managements are emphasized in BSC, the linkage
between strategic plans and operational plans is depend on the same structure of
Hoshin Management. Also, in financial terms of planning phase, they also use
traditional budgeting.

However, we issue a new structure and process about strategic management. This
new structure is showed in Figure 3-1 with using program and project management and
also PBSC (program and project balanced scorecard).
This firm shown in Figure 3-1 has multiple business units and he must produce
business plans or action's program. This program is equal to strategic action plans
including multiple projects. If we would try to classify programs into two types of them,
one is transformation program and the other is regular or current program. The
difference between transformation and regular programs is the followings. The former
is a new action plan to change total structure of value chains and the latter is to change
task contents or structures. This radical change is related to new market or new
products at least.

Two types of programs are interrelated and change business units' management cycle
or improve such cycles. An individual planning to do such change depends on a content
of a project. However, generally there are so many projects in each program. We must
use the project portfolio for evaluating project ordering. This portfolio is constructed by
X and Y axes, and X-axis indicates “project risk” and Y-axis indicates “financial performance”. We can put each project into this map and evaluate total program.

Figure 3-1 PBSC for connecting strategy and program & projects

Operation Program
Mission

Strategy and Program & Projects

- Account Management
- Group Product Development
- New Business Development

Value Management (PBSC)

Operation Program Mission

realize an linkage of Project and Strategy
Also, we present budgetary control as a box, and traditional financial control which includes current program or transformation program is made at incremental cash flow basis as a long period budget. But, translating it into short period budget, this short period budget is truly implementation plan or performance measures. Thus, we translate from cash basis budget into accrual basis budget.

What relations in such PBSC are recognized in this company? Basic BSC is explained in Figure 3-3. This figure show strategic program-BSC. This BSC is similar with the one explained by R.Kaplan and D.Norton and four perspectives or goals (financial, customers, internal processes, and learning and growth) are explained.

This basic BSC is not clear for how to keep the implementation pf business line projects and we could not explain the concrete action from such BSC. This action plans or action goals are explained by strategic map which Kaplan and Norton indicate. We do not consider this strategy map to be one shot map and rather try to divide such strategy map making process into three stages as a strategy scenario. Thus, there are three maps, a first Map which is concerned with strategic scenario to produce value goals, and a second Map which is concerned with the relationship between strategic program and projects, and a third Map which is related to project-BSC for valuating project in multi-measures. Figure 3-2 shows three levels in strategy maps. Each map has unique function and the content of each map is shown at figure 3-4 as an example of the first level.

Figure 3-2 PBSC (program & project BSC) and strategy
This figure 3-2 shows also the relationship between strategic management and management accounting. In another saying, management accountings introduce implementation management and make a linkage function for management and implementation.

The Basic relationship of BSC is shown at Figure 3-3. We can grasp the basic causal orderings by means of strategic Map, which is more detailed developed from a Basic BSC. There are three or four multiple performance goals to be inter-related based on a kind of causal ordering. Each kind of different value measures indicates concrete qualitative or quantitative indicators. Especially Figure 3-4 shows three kinds of relationship among program BSC's goals, value indicators, and project budgets.

Strategic success factors are choused from key factors in each value indicator. Customer's perspective is to obtain a customer's satisfaction, a process perspective is to obtain and keep an excellent operation process. Also, a growth and learning perspective is to educate excellent engineers. To promote such goals into specific measures, PBSC will set up a custom's ratio, option's ratio, more efficiency of production process, and a degree on the using and on accumulation of technologies as specific objectives. These goals or objectives are ultimately connected to cash flow goals or financial goal's achievements.
Figure 3-3 Basic Balanced Scorecard

Fours Perspectives of Goals

**Financial Perspectives**
- 財務的成績を反映するためには株主に対して何を示すべきか
- 目標
- 尺度
- 目標値
- 初期実施項目

**Customer Perspectives**
- ビジョンを達成するために顧客に対して何を示すべきか
- 目標
- 尺度
- 目標値
- 初期実施項目

**Vision & Strategy**
- 株主と顧客を満足させるためにどの業務プロセスが卓越しなければならないか
- 目標
- 尺度
- 目標値
- 初期実施項目

**Internal Process Perspectives**
- ビジョンを達成するために変化および改善する能力をどのように維持するか
- 目標
- 尺度
- 目標値
- 初期実施項目

**Learning and Growth Perspectives**
- 財務的成績を反映するためには株主に対して何を示すべきか
- 目標
- 尺度
- 目標値
- 初期実施項目
6. Making a strategic Map

Let us take an example of PBSC from Boeing Company with using a case of Boeing 777 airplane development program. Figure 4-1 is the strategic Map of PBSC of Boeing Company. Here are two large scale strategic programs for achieving specific financial goals to be described and operational projects for achieving these programs are not explained there.

These strategic programs are consisted of a new airplane development program and strategic alliance program. The former is to focus a new airplane development and to do into practice “PJ1” program is concerned with two kinds of “PJ”, these are to construct virtual development systems and also is to develop new body’s material resource.

A strategic alliance program is consisted of “PJ2” and “PJ3” and each of such projects is related to global SCM project, a cabinet’s development and production with customer’s conscious and new cost management to be called as Target Costing. To promote such process management, what kind of knowledge or technology should be kept or reinforced in engineers or marketers? These kinds of knowledge areas’ perspectives are shown in a bottom line of this table. IPT in this figure means “Integrated Production Team” and a production management team who involves marketing, customers and development’s engineers is sharing a various kind of
information with customer's demand.

Figure 4-1 A strategic MAP to create program-BSC

A making of a strategic MAP with using PBSC methodology is to make a scenario of relating various kinds of project to an organization, technology and people. And, all of employees are sharing their own task, his function, and other information. This PBSC is a communication tools and also linking all of projects. This PBSC is not an accounting tool with calculating money but a management linkage from a strategy to each specific project. That is to say, PBSC is to achieve a direct communication function from strategist to engineers of program & projects.

Conclusions

PBSC and a linkage function between value management and strategic program is though to show today's' management problems. What kind of linkage to management projects from a strategy or mission could be made? We can recognize that PBSC supply us of one solution about such problem. However, this methodology has a lot of problem issues. One of such issues is "Efficiently whose work is this breakdown from a scenario analysis to strategy maps?" Also, we need not an accumulation type budget but an incremental budget based on detail cash estimation to solve a problem. Thirdly, this PBSC need multiple based criteria and it is de-emphasized that accounting measure is
an integrator such as EVA and MVA in traditional management accounting.

Lastly, we could not discuss the post-evaluation for projects or program by means of PBSC. But, business is done along the specific mission or program as cross functional team and not as line management, and more and more work of managers and line staffs is shifted from current work to transformation work. Naturally the big problem is how to evaluate their performance or individual performance and how to linkage such performance into rewards or penalties.

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