Innovations in Delivering Value
— Developing Substitute for VE program

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Abstract

“Innovations in Delivering Value” are booming in the world, especially for the terminology of “Innovalue” [1], [2] that Taiwan has created. It comes from the initial definition of “Taiwan Excellence Gold / Silver Awards” which alleges the innovation-product value delivering to the customers. This article explicates engineering and purchasing as well as innovation product or service in how to deploy development of Value Engineering (VE) substitute programs in stages of designing or public bidding. It is interesting in explaining innovations on delivering entities and concepts of value, analysis structures of innovation value, and deployment of operation procedures of VE substitute programs by focusing on critical theories, techniques, & explication of methods. The author attempts to deliver the knowledge and experiences in: 1. transfer conceptual model of innovation-value VE-knowledge, 2. formation of VE substitute programs in mental deployment, 3. deployment of VE substitute programs mechanism, 4. selection path of VE substitute programs. A growing knowledge-based economy will influence these theories and techniques for references of learners & experts.

Key words: Innovalue, Value Engineering (VE), mechanism, Performance, Delivering Value

1. Introduction

Because Taiwan enterprises are paying attention to globalization deployment which influences layers of business management, they are especially facing on developing the 2 ends of the smiling curve for innovations & services, and simultaneously continuous driving value creation and innovation, and proceeding these 2 creating strategies. Recently, there are very hot dialogues in 3 terminologies: one is “Value-Transparency” [3], another is “Knowledge transfer” [4], and the other is “Value transfer” [5]. The meaning of these 3 terminologies fully responds to the research topic “Innovations in Delivering Value”. So, this article focuses on VE academic theory and the optimal practice experience which performs that corporations have felt the pressure for fast-paced innovations and knowledge transfer as major driving forces in creative product and service, and in raising their sustainable competitive advantage and organizational total productivity. In Section 3, three aspects of the core principles approach drawn from the case company’s real progress and practical experience were analyzed, namely Concept, System and Mapping so as to understand what value chain framework. In the past, the author had published “Creating VE/VM Simultaneous Learning and Teaching Model” [6] in China, and Actuality Survey in Education & Training of VE/VM Activities —Comparison Research between Taiwan and Britain [7], and New Thinking of Development of VM for Upgrading Technology Economy” [8]. All has focused on exploring VE theory and experience, especially for emphasis on cultivation of “integration”, “systemization”, & “knowledge”.

2. Innovations in Delivering Value’s Entity and Conception

The basic thinking of innovations is 「the process for new things (physical objects) or new creations (impalpable ideas) that creates value」. Innovation is to let creations (new ideas) generate values. Economy activities of innovations indicate 「a kind of new economy behavior which owns value」, so economy activities are fresh. 「Innovations of economy activities’ indicate ‘proceeding revolution of new business model (to add new elements) in the present economy activities, thus generating value-added’’. So, economy activities are old, but operation methods are new. Yet, all purposes are for creating value [9]. In other words, innovative composite elements are: First, it needs new ingredients
or new things. Second, it needs capability of creating value. Its basic value is business value [10]. Positive meaning of innovations is the brave to change the actualities. Possibility in accepting changes and alternation is to have innovative opportunities. Let’s go back to the original point. It is different between innovation and creation. If they cannot generate value, or the outcome in innovation reduces total value, then that is not innovation. The relationship meaning in the above innovation entity and value has explained clearly. The entity and concept in “Innovations in Delivering Value” are: corporations to increase value-added by innovations, or to increase the customers’ value by cost reduction, and then deliver values to the customers. This article quotes the two authors Kim and Mauborgne who publish “Blue Ocean Strategy” which says: when economy activities of corporations toward cost structures and corporations providing the customers with values can amplify advantage influence, then it can create value innovations [11]. We impel VE for products’ effectiveness, selling prices, and cost activities as appropriate value innovation or innovation value. Innovation activities in this article’s explication cover enterprise’s functional and executable activities.

3. InnoValue Knowledge and Delivery of Technology: Concept, System, Mapping

The origin of innovations may explicate before the final bidding. Suppliers have to submit innovation substitute programs based on bidding criteria, and explain in detail about the contents of substitute programs which include items of substitute programs, differences between prime and substitute programs, effective reasons for substitute programs which can shorten lead time and reduce budget & increase efficiency, substitute programs which may involve pros-and-cons situations and effective analysis, and other items in regulations of bid documents. The author emphasizes learners have to enhance to learn innovations in the thinking model of delivering value, proposing the conceptual model of VE knowledge of innovation value for references.

3.1 Concept — Transfer Conceptual model of VE Knowledge of Innovation Value

How to generate VE substitute programs by applying innovation value? First, it is by using conceptual model of VE knowledge to understand the necessary conditions of constitutes in basic knowledge, operating mechanism, operation procedures, and analysis methods. It proceeds step-by-step to think of organization’s implicit-knowledge communication, and to gestate innovation knowledge transferring to explicit knowledge. It is to control the purpose of program requirements, to apply the appropriate methods, to approve sufficient conditions of authorization within the permission under law or organization’s regulation environment, and to incorporate into and apply innovation value knowledge which includes: innovation value theory, value analysis, value evaluation of policy decision, value engineering, --- etc. in order to achieve and meet explicit knowledge in necessary conditions. Sufficient conditions include internal organization’s related measures such as substitute mechanism, VE-standard operation procedures, --- etc. To add necessary conditions' regulations to public bidding documentation such as supplement conditions of bidding notice, substitute programs of supplier bidding. To regulate suppliers’ criteria to let mechanism run in an orderly manner, and to provide the purpose of VE operation thinking and knowledge/theory/evaluation methods in a method stage to execute strategy-decision power, thus producing optimal value. See Figure 1. shows the conceptual model of innovation value knowledge.

3.2 Mental Delopyment of Formation of VE Substitute Programs

Based on “Conceptual Model Application of Innovation Value Knowledge”and hope to complete innovative VE substitute programs by procedures & sequences, it will transfer suppliers’ intellectual properties to the outcome of project engineering. In fact, many strategies and purpose-passing methods, and then to execute effective outcomes which can convert intellectual properties to financial properties. Before this article introduces mechanism of VE substitute programs, let’s explain practice methods of substitute programs, and use saneness charting method to depict thinking-elements. As long as it suits each of regulations in public-bidding documentation and substitute-program contents of final bidding, it will be approved and accepted for confirmation of the agreement engagement. Then, when we deploy VE substitute program, it shall have a complete set of measures which include 2 levels. One is logic contemplation which includes stages of policy, plan, and design, and contemplation in execution stage. The other is the timing to give substitute programs: in design stage, in public-bidding stage, and in agreement stage. During thinking, it needs to cover purposes & methods of each of activities in all
processes. Sufficiently prepare key factors and their documentation via VE process, and make them complete.

It has to adopt regulations of mental figure for deployment of mental figure to upgrade mental freedom. In other words, finding capability of orderliness in complexity, the importance is to separate into technique and design. So, when team proceeds VE-method discussions, it needs to make good use of left and right brains. More appropriate speaking for people making good use of left brain is good at logic, ratiocination, induction, and analysis. People making good use of right brain are good at space, color, rhythm, imagination, and creation elaborating freely and heartily. To generate innovative knowledge & intelligence, and then go through and blend business development’s strategy, objective, technology, and method together in order to produce executive mechanism. The following below is to introduce VE substitute program in design stage as the structure and element of contemplation. Contemplation aspect in design stage is contemplation of strategy, plan, and design. And then thinking of design in contemplating simultaneously 3 structure-aspects which include: substitute programs in design stage, in public-bidding stage, and in agreement stage. Finally, it needs to proceed to contemplate the related factors in these 3 stages:

1. Substitute Program in Design Stage: Permission Conditions, VE Evaluation.
2. Substitute Program in Public Bidding Stage: Beginning Bidding, Final Bidding, Making Contract, Submission Opportunity, Review, Contents, Follow-up Issues, and unengagement of the agreement, … etc.

3.3 System — Mechanism of VE Substitute Programs

One of this article’s main goals is to create/establish/execute design of substitute-program mechanism. Previously, we have talked about conceptual model of substitute programs. In order to execute VE substitute programs smoothly, the author constructs an execution mechanism, as Figure 2. that shows VE execution mechanism which includes: 1. Internal organization to set up a knowledge management platform, to thoroughly establish fundamental technology of substitute programs such as industry knowledge innovation, value-engineering applications, 2. establishment of VE simultaneous -team such as purchasing unit, contractors, consultants, cooperation units, etc. 3. knowledge and procedure of VE substitute-program operations such as registration of substitute programs, value evaluation methods of substitute programs, concretion operations of substitute programs, implementation of substitute programs, substitute outcomes, and value evaluation. 4. purchasing operation knowledge and procedure in each of stages such as operations in design stage, operations in public bidding stage, operations in contract stage, operations in inspection-acceptance stage, … etc.
3.4 Mapping ─ Selection Path of VE Substitute Program

Mainly, research and analysis selection of management value engineering is for justifications for whether there are any other much more valuable substitute programs for that engineering or not. The desire to produce academic theory and conception of substitute programs includes: value evaluation of substitute programs and purpose of concretion, value evaluation methods of substitute programs, conception chastening, and value evaluation of substitute programs and sequence of concretion. See Figure 3. analysis map of substitute programs that shows its steps: 1. first, to set up a research group of value engineering to make good preparation in prior-to and on-going and follow-up stages of research analysis. 2. to submit substitute programs by requirements, to ask for 5 questions before submitting substitute programs: (1) to possess creation? (2) possible costs? (3) possibility of further development? (4) lead time for development? (5) possible effectiveness? 3. to select creation conception, choose possible practicable conception. 4. to make VE evaluation report: attention & timing before submission of evaluation report such as to list already-evaluated-practicable conception, to evaluate weight of standard, and to specify operation steps, etc. 5. to select substitute programs of conceptual development to provide designer and management making strategy decisions 6. to execute VE substitute program 7. to analyze and feedback outcomes.

4. Operation Procedure for Deployment of VE Substitute Programs

Here are steps for operation procedure for this article’s deployment of VE substitute programs: 1. Proposal of Substitute Programs, 2. Value Evaluation and Concretion of Substitute Programs.
Research & Analysis Group of Value Engineering

To Submit Innovation Substitute Program

To Select Creation Conception, Choose Initial Practicable Conception

Evaluation

No

Yes

Selection

To select substitute programs of conception development to provide designers & management making strategy decisions

Execution

Outcome Analysis & Feedback

1. Preparation Stage before Research & Analysis
2. On-going Stage of Research & Analysis
3. Follow-up Stage of Research & Analysis

Use Opportunity:
1. List Concepts, Evaluate Their Practicable
2. Evaluate Weight of Standard, Specify Operation Steps

Figure 3. Analysis Map of Substitute Program

4.1 Proposal of Substitute Programs:

During proceeding proposal of specific substitute programs, we have to think of the following items for conceptual aspects in order to avoid diverting the subject from the substitute program. Proposal characteristics in this article are separated into general methods and VE-activity applications which describe as below:

1. General Methods—provide conception in the light of the actuality objects or operations: easily persist in actualities, during concretion, it easily immerses in worrisome or constrained, and people think of submitting craziest ideas as an insult, anything as redundant, and giving insufficient ideas.

2. Methods of VE—in accordance with function analysis of objects and submission of innovative products or services, applying VE activities for providing conceptual-method characteristics which include completely not constrained, wholeheartedly submitting conception via corporate group, the more wildest fantastic idea the happier, submission of more than 100 ideas that would communicate much better in adopting effectiveness of innovation value by VE method.

For articulation-innovative-target’s product or component’s function (purpose & function), we need to decide innovation or follow-up improved function, then to start providing the improvement project in relation with that function. As Figure 4: Conceptual-logic-system model of innovation proposal that shows it has been often used on innovation value strategy generating products or services, and innovation engineering method, and process reengineering, and operation model of the customer-demand satisfaction.

3. Describe Substitute Program, then Select Characteristics: not to persist in the actuality, and we shall use the own-function center of that product or component to develop innovation or VE-improved activities, and select substitute programs. Because of defining function by noun + verb, anything that can perform conception of functional methods, and proceed to select substitute programs via team, then we can hand in a pretty high report card.
4.2 Value Evaluation of Substitute Programs, and Concretion

The origin function of articulation is eyeing on low-value functions, and thinking of good methods of possible substitutes. To the actuality, the nowadays sequence should provide multiple substitute programs as opportunities to proceed survey and creation research as well as the center for visiting and activities. Value evaluation of innovative VE and key points of articulation are: 1. the purpose of substitute programs — should be function-position thinking of reaching pros-and-cons of that function, then make good use of advantages to develop innovations or improvement projects. 2. value evaluation methods of substitute programs — in the field of value engineering activities, the most important item is not the outcome of value evaluation, and it is the in-depth self-creation thinking by the process of value evaluation. What value evaluation is not denial of conception, and it is detail survey in conception, and depth analysis and value evaluation in articulation contents of conception have achieved creative views. 3. Extraction Concepts — in order to grow well the burgeon of substitute program’s conception, we cannot simply and immediately make conceptual concretion, and should gradually, persistently proceed “creative viewpoints”, “value evaluation”, and “survey” to make progress. 4. value evaluation of substitute programs and sequence of concretion: pros-and-cons of articulation-substitute programs, in the light of cons, survey items of articulation, review items, survey of implementation. To submit concepts and value evaluation, according to the outcomes of survey.

4.3 Operation Contents in Design Stage:

1. Research & Analysis of Value Engineering:
   (1) Design dept. to set up a VE group to practice research & analysis of substitute programs.
   (2) To modify design contents and make the bid documentation after VE evaluation.
   (3) Substitute Programs with suggestions: to evaluate & justify for adopting the items in substitute programs during bidding or construction period, and then submit to the business proprietor for references.

2. Bid Documentation that allows to submit substitute programs’ conditions
   (1) to classify by engineering scale
   (2) Purchasing Items that don’t influence total risk
   (3) If the outcome in labor cost analysis is not suitable to adopt substitute programs, they will be eliminated as negative in a list.

4.4 Table 1 shows Analysis of VE Substitute Programs and Their Critical Contents which Taiwan has currently driven.
Table 1. Submission of Contents of Substitute Programs for Bidding

<table>
<thead>
<tr>
<th>Regulation requirements</th>
<th>Suggestions of research methodology: references for Value Engineering and Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Items of substitute programs and their detail explanation</td>
<td>Execute Abstract, Produce List of Conception, and Conception Comparison Table</td>
</tr>
<tr>
<td>2 The differences between substitute and Prime Programs</td>
<td>Function Analysis Data (including Cost Model, Cost Bar Chart), Timing, Quality, Security, Budget Analysis</td>
</tr>
<tr>
<td>3 Substitute programs are sure of the reasons for reduction of lead time and budget, or efficiency increase</td>
<td>Schedule Analysis, Critical-Path Analysis, Cost-Effective Analysis, Life-Cycle Cost Analysis, List of Cost Savings, Value Proposition</td>
</tr>
<tr>
<td>4 Substitute programs which may involve various kinds of pros-and-cons situations</td>
<td>Effectiveness Analysis: for Adoption of Substitute Programs in Derivation Interfaces such as Analysis of Budget Increase, Life-Cycle Cost, Each Item’s Interference Analysis, etc.</td>
</tr>
<tr>
<td>5 Other items in Regulations of Bidding Documentation</td>
<td>1. Basic Charts to Specify Budget (Detail List, Analysis Chart of Piece). 2. Prior to Expiry Bidding→Design Completeness 50-70% (Follow the methods of BOT Bidding) (Detail List enough to incorporate into the contract of final bid), after winning award for the bid, we submit Detail Design, based on the original-bid substitute program.</td>
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5. Conclusions

After completeness of the research, we can lead to a future goal of e-learning for VE, and emphasize learning atmosphere of organization, and enhance competency, and furthermore, influence by a growing knowledge-based economy. It emphasizes 3 transformation concepts in deploying the operation procedures of VE substitute programs: 1. ‘Value-Transparency’ is a development of ‘cost transparency’ must to manage a project management performance. 2. Knowledge transfer is a relatively important work as part of the knowledge management activities. 3. Value transfer, also called benefit transfer, leads to ‘source system’ will benefit from the transfer the ‘target system’. Thus, the future value of e-learning within a knowledge community is that systems are designed to emphasize innovation and knowledge sharing.

References