

A METHOD OF DETERMINING REASONABLE TARGETS FOR VA ACTIVITIES CORRESPONDING TO VA SKILL LEVEL

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Akira Tachi joined the TOA Corporation (General Contractor) in 1979. He has been in charge of VA activities since 1984. He was promoted to Project Leader of Planning Management Division (Value Analysis (VA) Development Center in the Yokohama Branch in 1987. He has presented "New Evaluation System of VA Proposals" to the national SJVE conference in 1988 and this paper's topic for the 1993 conference.

ABSTRACT

This paper presents an effective method to determine the VA promotion management targets, maintain and improve the potential of the VA activities continuously over decades. This is based on the VA Promotion Management System that is being applied on a company-wide scale at TOA Corporation.

Introduction

The recent domestic business trend centered on personal consumption and plant investment, continues to be in a sluggish state which started after collapse of the "economic bubble."

Even in case of the enterprises of good standing listed on the first section of the Tokyo stock exchange, the effect has been great. Businesses are refraining from any extreme hiring of new employees, etc.

Many enterprises built up their present status by tackling severe changes of the environment since their establishment. During this time, the business environment of the enterprises changed constantly and the "ups and downs" were considered to be natural. In the past, holding back investment in managerial resources was considered to be the most effective measure for a quick remedy. This line of thinking may not change greatly hereafter also, it can be said to be the natural measure to be taken by enterprises which have no leeway.

When we look at business management from the medium and long range viewpoint, continuous investment of managerial resources (Examples: hiring new employees, education, training, etc.) that is constant to some degree, is an important factor to foster a balanced and stable enterprise.

However, the point I want to note here is that, in actuality, there were situations that were not ideal, and there is a high possibility that such situations may occur hereafter also.

Particularly, in respect to the personnel aspect, the age structure of the enterprise will become very unbalanced when there is a great variation of business performance each fiscal year and the number of new employees to be hired is affected as the result.

For an enterprise that introduces the VA system to attain growth by effective use of the system, improvement of the VA skill potential of the employees will become a greater problem in the enterprises with greater change in generations.

In our company also, 16 years have passed since the VA system was introduced. The VA conception (thinking) prevailed widely, and the "VA potential" should also have improved to the

maximum. However, the actual environment surrounding the enterprise has changed excessively. The employees grow older with changes in position, place of employment and status every year. There are persons who retire while there is an increase of new employees.

Even in such situation, once the VA system is introduced, the enterprise must attain growth without lowering the effectiveness and achievements of the system.

Since lowering of the VA potential is the greatest problem faced by the VA promotion department in the enterprise, it is always under the pressure of a crisis atmosphere.

The measures to be applied to overcome this problem are considered and proposed here.

Outline of Our Company's VA Activities and Achievements.

Before explanation of TOA Corporation's VA activities, I will introduce the business operations of the company.

TOA Corporation was inaugurated in 1908 as a construction firm. The fields of operation are civil engineering, real estate, buying and selling, planning, designing, consulting, etc. Among the fields of operation, the company's forte is marine civil engineering that accounted for 45% of ¥239.597 billion (¥239,597,000,000) sales volume in fiscal 1992.

The company's head office is in Tokyo, and it has 10 branch offices across the country and 20 business establishments overseas.

The total number of employees is more than 3,000.

The Branch organization consists of the Branch Office which supervises the entire Branch organization with a business office in each area and field offices that directly execute the construction work.

Since the firm engages in unit production as in the general case of the construction industry, the business office of the production department is set up at or in the vicinity of the construction site.

For example, the Yokohama Branch where I work, the business territory covers two prefectures, Kanagawa-ken and Yamanashi-ken. The number of employees is approximately 400. They are dispersed to 45 business offices where they engage in independent business activity.

Fig. 1 shows an organizational chart of a typical Branch Office.

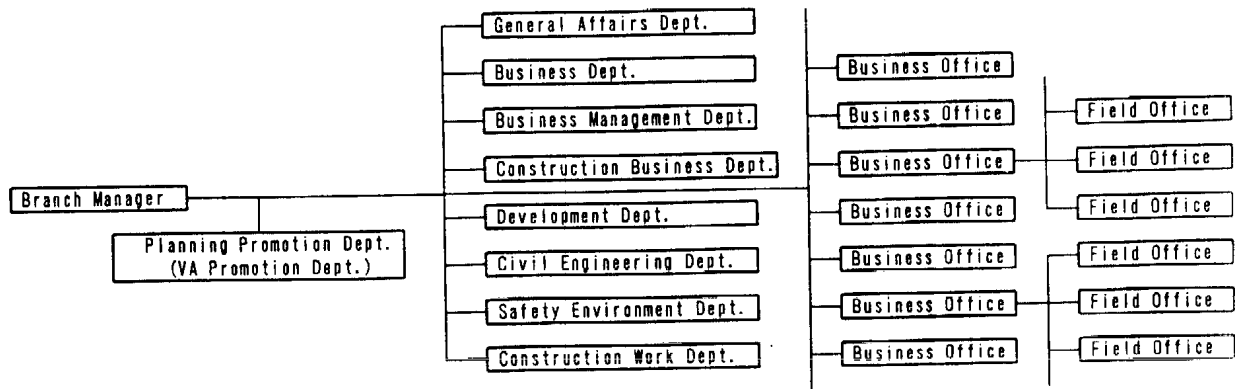


Fig. 1. Organizational Chart of Yokohama Branch

TOA Corporation introduced the VA system on a company-wide scale in 1977.

The VA system was promoted first in construction for the main purpose of cost reduction.

As in the case of many other enterprises that have introduced the VA system, the application fields were extended.

In the office work and service fields also, application of the system was extended.

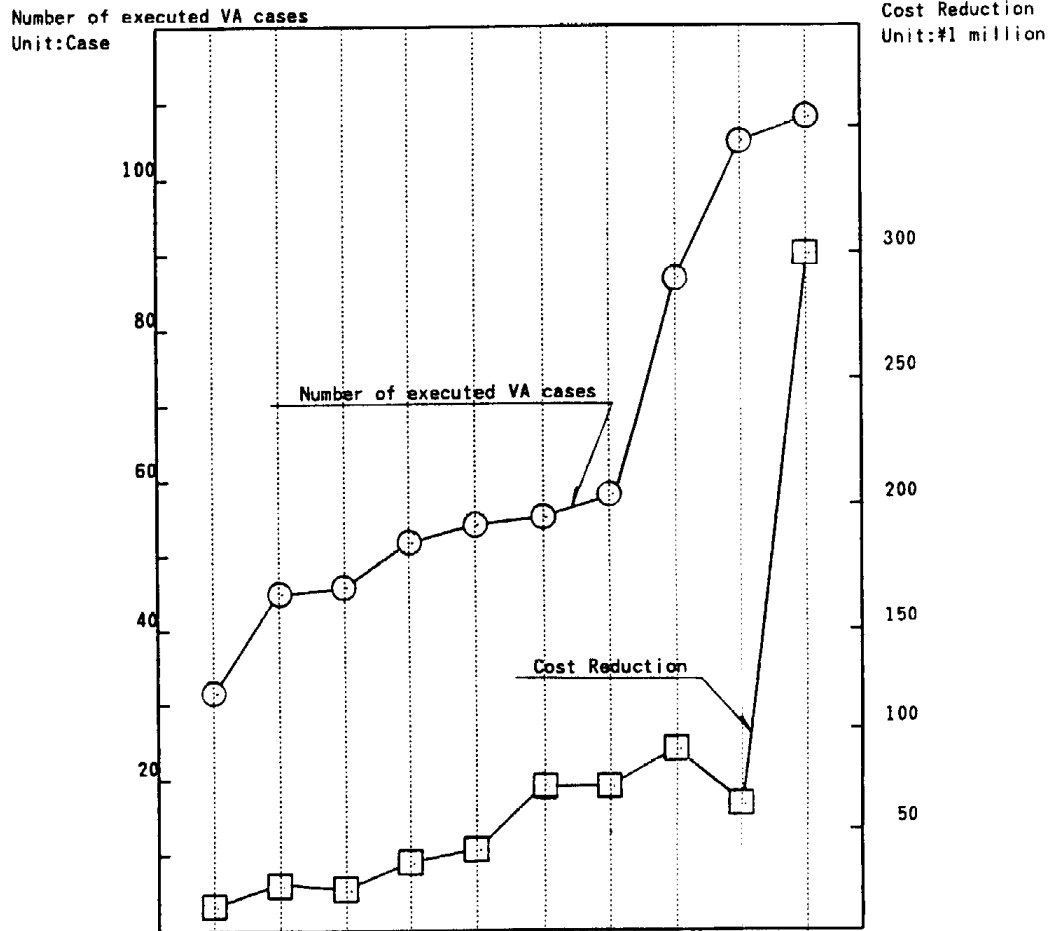
The VA technique was initially centered on "Second Look VA", but "First Look VA" and "Zero Look VA" have come to be used effectively, according to the theme. Naturally, extension of the

range of VA application will require research and development of a VA technique that will be suitable for the particular field.

Ingenious effort and improvement were required to achieve original application of the system in our company.

As a result of these efforts, the original company-wide VA system of TOA Corporation received the "Miles Award" (Business Department award). For our company, which is oriented toward the high ideal of effective use of VA by business administration, however, this is one passing point and further development is, of course, necessary.

The transition of achievements of VA activities over the past 10 years at the Yokohama Branch is shown in Fig. 2.



	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	Fiscal year
Number of executed VA cases	32	45	46	52	54	55	58	87	105	108	Cases
Cost Reduction	10	21	18	29	42	72	68	91	61	300	¥1 million

Fig. 2. Transition of VA Activity Achievements at Yokohama Branch

The transition of the executed VA cases and cost reduction figures shows some unevenness, but the curve can be seen to rise steadily.

VA Potential Evaluation Method of Company-wide Scale and Great Effect of Change in Age Structure of Employees.

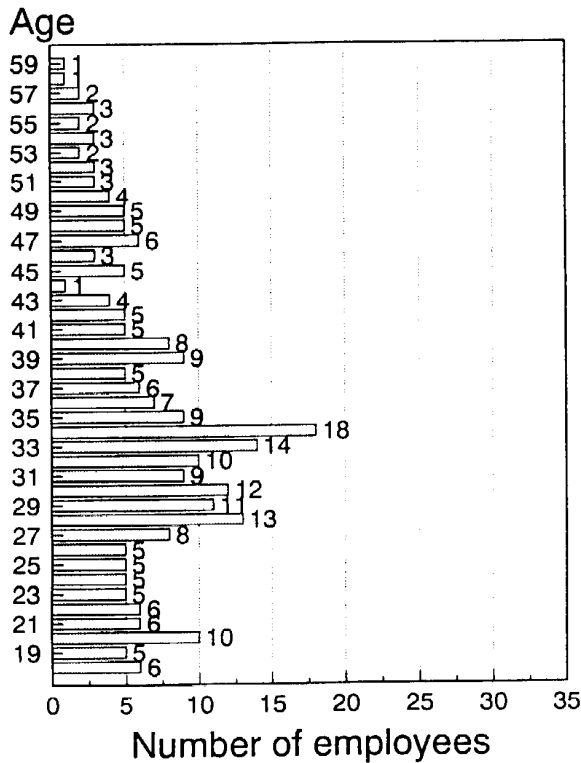
The Iran-Iraq war broke out in 1980. It had a major effect on the management of TOA Corporation that had advanced extensively overseas in the Middle East also and was engaged in a large scale construction project there.

Our company was able to tide over this crisis, from 1978 to 1983, by holding back on plant and equipment investment, sales of assets, major reduction in hiring of new employees, etc.

However, during the business boom years from the 1980s to the beginning of the 1990s, before the "Economic Bubble Collapse," hiring of new employees was increased gradually to cope with the lack of personnel. As a result, a major change arose in the age structure of the employees from 1983 to 1993.

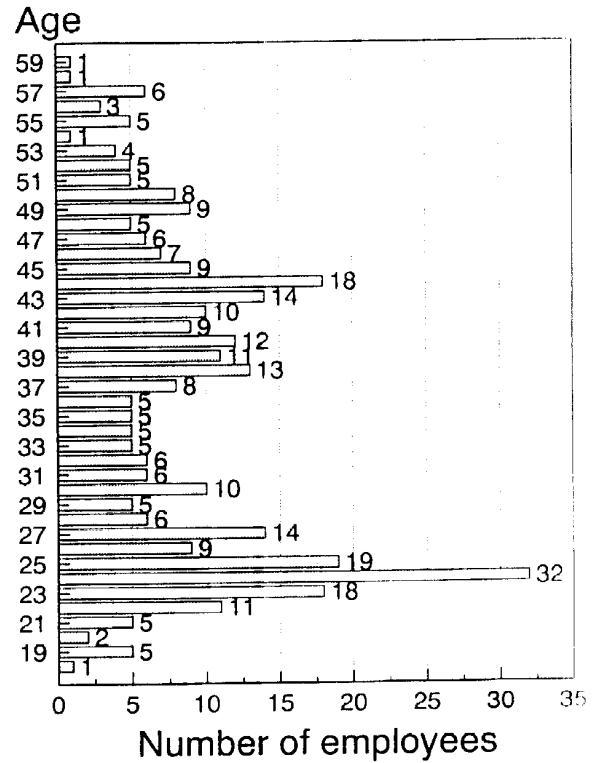
This is shown in Fig. 3.

Fiscal 1983



Total number of employees : s=255

Fiscal 1993



Total number of employees : s=339

Fig. 3. Age Structure Chart of Office Workers and Engineering Personnel at Yokohama Branch

A study was carried out to examine how this change in age structure of the employees was reflected on the VA potential.

The average frequency of participation in the VA activities by age bracket during the past 10 years at the Yokohama Branch was the highest for the employees of the middle age bracket of 25s to the mid 30s.

A quantitative grasp of the actual VA skill potential of the employees is very difficult, but the example of the Yokohama Branch was taken as data for consideration of measures for future improvement of this potential.

All employees of TOA Corporation are given basic training on the VA system in their first year of employment. Each employee has strong points and weak points in their capability. Although they receive the same VA training and experience, their comprehensive faculty and degree of improvement in capability will differ in many ways.

As an expedient measure it was assumed that the frequency of VA experience will be proportional to the VA skill potential. Under this assumption, the VA potential of fiscal 1983 and 1993 was calculated by the following formula.

Formula-1.

$$p = P/s = \frac{\sum (\sum (a \times b) \times c \times d)}{s} \text{ ----- Formula --- 1}$$

P: VA potential of that year

p: VA potential per person for that year

a: Number of times participation during that year

b: Number of years of employment at company

c: Number of employees of that age

d: Average number of times of participation of single fiscal year

n: Age

s: Total number of employees

$\sum (a \times b)$: individual VA Capability

$\sum (a \times b) \times c$: VA capability of that year

$\sum (a \times b) \times c \times d$: VA potential of that year

$\sum (\sum (a \times b) \times c \times d)$: VA potential of entire Branch

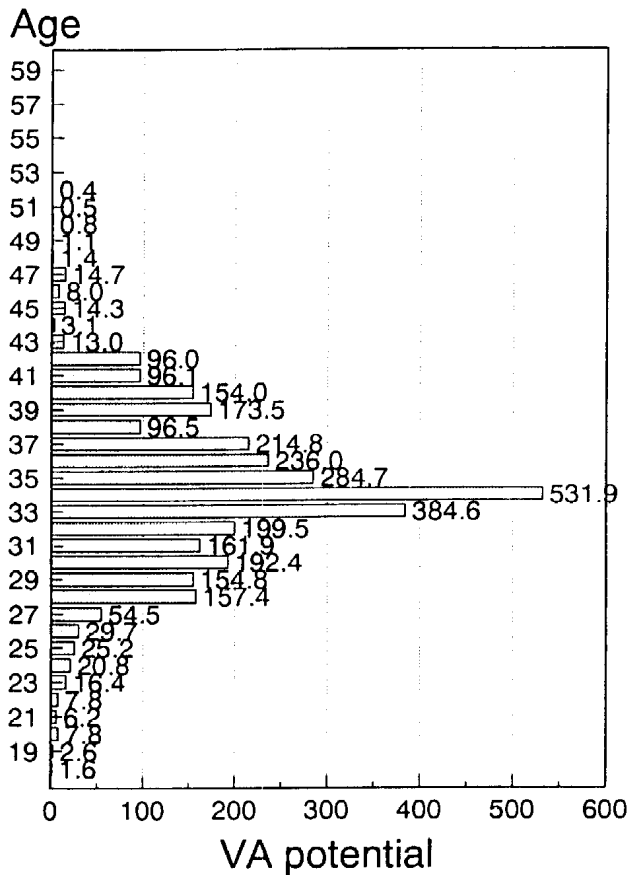
$\sum (\sum (a \times b) \times c \times d) / s$: VA potential per employee

In 1983, the VA potential was higher for the employees around the age of 30 to 35. In 1993, however, the higher potential rating centered around the age of 35 to 40.

Although the VA potential of the entire Branch in 1993 was about 6.7% lower than that of 1983, the VA potential per employee was 30% lower.

Since the result was based on one assumption, it cannot be applied for judgement of all cases. However, it can be understood that an extreme unbalance of the age structure will have a major effect on the VA potential also.

Fiscal 1983



Owing to the sense that all members of the company have been given the task of promoting the VA activities and the prevailing practice of placing importance on impartiality, the policy is often decided by the same criterion, regardless of the VA skill of each post.

When there is a difference of the VA level according to the region, the best plan is to select (1) or (2) in accordance with the level of the VA potential.

The evaluation method for the VA potential of the entire organization has been presented in Item 2. However, this method is not suitable for individual sections. Therefore, the method for evaluation of the potential level of each section and selective use of the management targets will be discussed next.

At TOA Corporation, the original VA evaluation system of our company has been used since 1987.

For details of this evaluation system, refer to the VE Research Paper VOL 21, Fiscal 1988, "Evaluation System of Future VA Proposals."

At the Yokohama Branch, the VA evaluation table shown in FIG. 5. is used for each VA application field. Evaluation has been taken for all executed VA in a form which also includes the line managers concerned.

Unless the contents of the VA proposal are evaluated appropriately with proper timing and follow up, a proposal with

possibility of very good results will fall into oblivion it will lead to loss of a great opportunity. The evaluation table in Fig. 5. is used to minimize such loss of opportunity.

The evaluation table items are used to examine the details of each step of the VA technique. This table can be utilized to determine the VA potential level of each execution post. The evaluation results are used as the basis for consultation concerning the VA potential level by the VA promotion department and the VA executing posts.

With the common knowledge gained by this process, each section sets the VA promotion targets, as to whether policy (1) or policy (2) will be the aim for each fiscal year.

When the VA promotion management target is decided in this manner, obsolescence of VA activities due to mismatch of "VA Potential" and "VA Promotion Management Target" can be prevented with certainty. This effectiveness can be anticipated.

In the VA promotion activities, it is general practice for the top management to properly recognize the available information in and outside the company, decide on the appropriate VA policy for the company, and provide motivation for development of VA activities.

Since the VA potential in own company will change easily, the VA promotion department must pay constant attention to the VA potential to have a firm grasp of the situation. This is essential for flexible setting of the targets so that the potential level and policy will be matched.

VA EVALUATION TABLE

(Construction Work)

Theme : _____

Date of proposal : _____

Section of proposition : _____

Evaluation Items	Valuers						Sub-total
	Leader	Site manager	Business office manager	Branch office person in charge	Manager in charge	G. M. in charge	
1. Proper as VA theme							
2. Appropriate on team design							
3. Satisfactory on collection of information							
4. Proper analysis of functions							
5. Good in quality & quantity of ideas							
6. Well studied in terms of technology							
7. Well studied in terms of economy							
8. Saving up to target values							
9. Desirable for spread over the whole company							
10. Desirable for patent application							
Total of evaluation marks							

Evaluation criteria

5 : Yes 3 : Middle 1 : No

Judge on execution of proposal				
Restudy	No	Yes		
Date	Date	Date	Accepted	Cautions & comments
			Rejected	Reasons for rejection
Problems			Countermeasures	
Remarks:				

Note : Execution of any proposal to be decided by site manager, business office manager in charge or G. M. in charge.

Fig 5. Coustruction work VA evaluation table

Conclusion

A deciding method of VA promotion management targets that are effective for the potential level evaluated for each organization unit has been proposed in this paper.

This method will be applied during the next two to three years to confirm its effectiveness.

I believe that there will be need hereafter for consideration of, not only evaluation of the VA potential for each section of the entire organization, but also evaluation in parallel of the VA potential of each employee.

In the process of improvement of the VA potential, firstly, increase the number of cases of VA execution to prepare members with high frequency of VA experience and improve the overall VA skill. As the next step, have the members with improved skill execute VA with more content to attain greater VA results.

If the available managerial resources (persons, money, time) to be expended for VA is limited at one business establishment, unrestricted commitment of the resources will not be possible.

When the number of VA execution cases is set as the target, a target of an excessive number of VA execution cases will lead to the tendency to select a small theme which is easy to arrange with easily obtained results. Consequently, the achievement level per case will be poor so that the incentive for execution of the next VA will be lowered.

This means that, with limited resources, unrestricted quest for both "Quantity" and "Quality" will cause "indigestion" and will lead to obsolescence of the VA activities.

VA-Potential Evaluation Method of Each Section (Organization) and Deciding Method of VA Promotion Management Targets.

The main points explained in the foregoing three Items can be summarized as:

1. If the end purpose of VA is improvement of the constitution of the enterprise, VA promotion management centered on the VA potential will be a requisite.
2. When the VA skill level is low, the number of VA execution cases should be set as the target to increase VA experience. When the VA skill level is high, a target that will contribute directly to the performance of the enterprises should be selected.
3. In case of limited resources, combined use of excessive "Quantity" and "Quality" will result in "Indigestion."

Based on these essential points, the deciding method for the VA promotion management targets in an enterprise will be discussed in here.

Basically, in VA promotion activities, linkage and coordination should be realized between the purposes and targets. For example, when there are two VA policies:

- (1) Improvement of management faculty by having more employees learn the management technique of VA.
- (2) Acquirement of greater practical results such as cost reduction and technology (Patents, Utility Model Rights, etc.) by VA activities.

For policy (1) the appropriate targets may be "Number of executed VA cases" and "VA participation rate." because increase of VA execution cases and handling of more themes by the employees will be effective for this purpose.

For policy (2), handling of larger themes will be effective.

Therefore, cost reduction, patents, utility model rights, etc. should be set as direct targets, without setting the number of VA execution cases as a target. Then, the employees should be induced to consider what kind of activities will be required to obtain a high level of VA results.

In this case, the VA scale will become elaborate as the theme becomes larger. Consequently, a considerably long time will be required from start of VA to the point where results can be confirmed. This will be a weak point because the VA promotion department will have difficulty in VA promotion management while comparing the results with the target for the year.

Unless all employees have a very high morale toward the VA activities, the promotive force for the VA activities may be weakened.

The actual organizations consist of a mixture of persons of low VA skill and those with high VA skill.

When policy (1) and (2) are applied at the same time in an organization of this condition, it will have "Harmful Influence" because the policies (purposes) and management targets will not match.

The "Harmful Influences" are lower level of results of VA promotion, lower motivation of employees, obscuring of purpose of activities, a feeling that a norm has been set for the work, etc.

The following measures are recommended for consideration:

If maintenance for dissemination of the VA concept is neglected, the VA potential will be lowered rapidly at an unexpected pace, as in the case of "entropy."

I hope to surmount the VA promotion department's eternal theme of VA maintenance and improvement, by proper application of the principle of "VA Potential Evaluation Method of Each Section and Deciding Method of VA Promotion Management Targets."

References (all in Japanese)

1. *VE Promotion Manual* Society of Japanese Value Engineering, Sept. 10, 1987
2. *Guide to VE, Terminology*, Society of Japanese Value Engineering, June 30, 1992
3. A Proposed System of Evaluating Proposals, *SJVE Conference Proceedings*, Vol. 21, 1988