CHARACTERISTICS OF V.E. APPLICATION IN JAPAN

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ABSTRACT

This paper depicts the characteristics of VE application and research in Japan. Annual national conference papers and case reports that have been published by SJVE have been comparatively analyzed against SAVE's annual international conference papers so as to visualize the profile of the subject. This paper will facilitate a deeper insight into the Japanese characteristics of VE application and research activities.

INTRODUCTION

There are so many VE papers that have been published to date by the SAVE International, the Society of Japanese Value Engineers (SJVE) and many others. Particularly, those published by SAVE and SJVE seem to provide two collective sources of information regarding how VE concepts and techniques are being used and researched in both countries, east and west.

A collective survey and comparative analysis of those VE papers so far published in both countries, with a focus on finding the Japanese characteristics in this professional area, should enable readers to have a deeper insight into typical characteristics of VE application and study in Japan.

OUTLINE OF THE SURVEY

Survey Samples Used

VE conference papers used as the two sample groups were: 1) VE papers and case reports that have been presented by Japanese speakers at their annual national conferences of SJVE since 1968 through 1995 and 2) VE papers presented by American speakers at SAVE's annual international VE conferences from 1966 through 1995.

Since its foundation in 1965, SJVE has annually obtained copies of SAVE conference papers to be maintained for reference, and likewise maintains all annual SJVE conference papers and case reports, starting with those published for the first conference in 1968.

For the purpose of America-vs-Japan comparison, papers by authors other than American and Japanese authors were not covered in the survey.

Survey Purposes

The survey was conducted in two co-related parts: 1) Organizational backgrounds of the authors of those papers,

and 2) The contents of their papers.

Part 1: Analysis of authors' organizational backgrounds

This part was intended to identify specific types of organizations where VE is being utilized. The resulting distribution should reflect types of organizations where VE is positively used. For survey purposes, authors' organizations were grouped into the following four dif ferent groups:

* Private industries
* Government and public circles
* Consulting firms
* Professional/academic research institutions

Part 2: Analysis of the contents of the papers

The purpose of this part was to reveal specific areas of VE research and application being undertaken by the authors. The resulting distribution should reflect major areas of authors' research efforts and VE utilization. For survey purposes, contents of VE papers being surveyed were grouped into the following seven categories.

* **Management of VE application**: Organized promotion of VE application, planning for and follow-up of VE application, other aspects of managing VE application

* **Specific application of VE**: Dealing with specific methods of application to specific projects, case reports on VE application and other practical situations

* **Technical factors of VE application**: Dealing with VE concepts and techniques, problem-solving processes based on VE concepts

* **Human elements in VE application**: VE-oriented competence and attitudes, communication skills, motivation approaches, and other human factors in VE application

* **VE promotion and enlightenment**: Intended for wider VE promotion and diffusion of VE disciplines, by emphasizing necessities and advantages of VE application

* **VE-centered survey reports**: Factual analysis and its results to identify VE application status

* **VE application on the part of government/public circles**: Governmental policies, reactions, practices, applications, etc., dealing with VE

RESULTS OF THE SURVEY AND ANALYSIS

Coverage of VE papers surveyed

Among the total of 600 SJVE conference papers and case reports published during the 28-year period of survey coverage, 575 or 95.5% represent Japanese authors. Likewise, 890 or 82.9% out of the total of 1,074 SAVE conference papers in the last 30 years represent American authors.

Unlike the single-book compilation of SAVE Conference proceedings, SJVE proceedings of each year consist of two volumes under different titles: Volume 1 containing selected conference papers and Volume 2 case reports. Conference papers as used here represent results of authors' theoretical and/or methodological research in the form of VE theses, and case reports introduce actual results or stories of VE applications undertaken by the authors. Table 1 shows a breakdown of such conference papers and case reports counted by the six different time periods:

Table 1: SJVE conferences' selected papers and case reports

Period	Selected papers	Case reports	Total
'68–'70	23	12	35
'71–'75	49	36	85
'76–'80	55	49	104
'81–'85	77	52	129
'86–'90	74	43	117
'91–'95	54	51	105
Total	332	243	575

Table 2: Trend of Japanese authorship

Type of organization	Time-period of coverage '68-70	'71-75	'76-80	'81-85	'86-90	'91-95	28-year Average
Private industry: Manufacturing	86.5	79.3	77.1	29.5	48.2	50.3	53.1
Construction	2.7	16.0	22.3	67.1	42.3	36.8	40.6
Services				3.4	7.5	8.0	4.0
Governmental/public orgnizations							0
Consulting firms						0.6	0.1
Professional/academic institutions	10.8	4.7	0.6		2.0	4.3	2.2

Table 3: Trend of American authorship

Type of organization	Time-period of coverage '66-70	'71-75	'76-80	'81-85	'86-90	'91-95	30-year Average
Private industry	60.4	41.6	31.9	40.4	18.9	13.7	36.3
Government/public organizations	17.1	22.9	22.2	17.7	27.2	26.7	22.1
Consulting firms	8.1	19.9	32.6	27.7	36.7	41.1	26.1
Professional/academic institutions	2.3	3.6	5.2	4.2	7.7	5.5	4.6
Others	11.7	5.4	3.7	5.0	3.0	7.5	6.4
Unidentified	0.4	6.6	4.4	5.0	6.5	5.5	4.5

PART I: Authors' organizational backgrounds

Japanese profile: The number of Japanese authors who were related to those 575 papers was 932,or 97.0% of the total of 961 for the entire period of survey coverage. The organizational background of Japanese VE authorship is extremely dominated by 910 practitioners from private industries, representing 97.7%.

Classified by types of industry, 495 (53.1%) represents various manufacturing industries, 478 (40.6%) construction sectors, 21 (4.0%) service industries, and virtually none from consulting firms and also from government circles.

Reviewing the Japanese trend as illustrated in Table 2, we can find that the percentage of authors of manufacturing backgrounds dominated in the 1970's and the percentage by those of construction backgrounds increased in the 1980's, with some newcomers joining from service industries.

American profile: Meanwhile, the number of American authors was 976, or 81.1% of the total of 1,207 authors, as shown in Table 3. Their organizational backgrounds can be characterized in that the three highest circles – 36.3% representing private industries, 26.1% consulting firms and 22.1% governmental and other public organizations – altogether dominating the picture with a total percentage of some 80%.

Altogether, American private industries have been generally highest in VE paper authorship, but the recent trend since the latter half of the 80's shows a sharp fall. In the meantime, authorship from consulting firms keeps showing higher percentages than any other circles since the latter half of the 1970's.

Also, the government and public circles maintained higher percentages than their average percentages since the latter part of the 80's. Thus, the total percentage for both the government/public circles and consulting firms together exceeds the 60% level since then.

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PART II: Analysis of the contents of the papers

Japanese profile: The great majority of SJVE papers surveyed represents the category of " Specific application of VE," with 355 papers (61.8%), followed by those under the category of " Technical factors in VE application," with 158 papers (27.5%), as shown in Table 4. Thus, 90% of Japanese VE papers can be seen as coming under these two categories.

Table 4: The contents of Japanese papers

Category	Time-period of coverage '68-70	'71-75	'76-80	'81-85	'86-90	'91-95	28-year Average
Management of VE application	8.6	7.0	5.8	7.0	9.4	6.7	7.3
Specific application of VE	51.4	63.5	70.2	59.7	57.3	63.8	61.8
Technical factors of VE application	22.8	20.0	23.1	33.3	29.9	29.5	27.5
Human factors of VE application	8.6	6.0	0.9		1.7		1.9
VE promotion & enlightenment							0
VE survey reports		1.2			1.7		0.5
Government & public aspects							0
Other topics	8.6	2.3					1.0

Table 5: The contents of American papers

Category	Time-period of coverage '66-70	'71-75	'76-80	'81-85	'86-90	'91-95	30-year Average
Management of VE application	12.9	9.6	10.0	5.6	8.7	10.2	9.8
Specific application of VE	16.3	14.7	30.8	28.6	17.5	14.2	19.8
Technical factors of VE application	24.3	23.7	24.6	31.0	26.2	30.7	26.4
Human factors of VE application	10.4	5.8	3.9	11.1	10.1	10.2	8.7
VE promotion & enlightenment	13.4	17.3	16.1	6.3	14.8	15.0	13.9
VE survey reports	0.5	1.3	0.8	2.4			0.8
Government & public aspects	15.3	17.3	6.1	6.3	20.1	14.2	13.8
Other topics	6.4	10.3	7.7	8.7	2.6	5.5	6.8

Further analysis reveals that 243 among the majority group of 355 papers under " Actual VE application methodologies" represent " case reports" from Volume 2 proceedings, and that these come up to 42.2% of all Japanese papers. Thus, the net percentage of purely " Selected conference papers" as Volume 1 proceedings under the same category is 19.6%.

American profile: The highest percentage here is 235 American papers with 26.4% under " Technical factors of VE application," followed by 176 (19.8%) under " Specific application," 124 (13.9%) under " VE promotion & enlightenment" and 123 (13.8%) under " Government & public aspects." The overall trend is illustrated in Table 5.

JAPANESE VE STATE OF THE ART AS CHARACTERIZED THROUGH THE COMPARATIVE ANALYSIS

Supported by the result of subject survey, VE application in Japan can be characterized in such aspects as types of organizations where VE is being applied, what are major areas of VE application and research, etc..

What are VE-using organizations?

The largest group of VE-using organizations in Japan are private industries, with a dominating percentage of 97.0%. This is where we can see a sharp contrast between USA and Japan.

American percentage is highest at 36.3% for private industries. By adding this to 22.1% for government and public circles, we can say that some 60% of American VE papers have been written by authors working for private and public organizations.

What are major areas of VE utilization?

VE utilization is most active within the manufacturing sector and construction sector of private industries, as can be proven by the fact that 93.7% of Japanese VE authors are from these two sectors.

Among the total SJVE membership, manufacturing membership represents about two-thirds and construction about one-fourth. This implies that VE is more widely spread in the manufacturing sector than in the construction sector.

A similar American trend can be seen in the two sectors of manufacturing and construction where the data shows that the largest portion of private industries represent the manufacturing sector and many papers from government and public sector deal with construction themes and topics.

It is notable that there are active newcomers in Japan in the use of VE, in addition to the above two sectors, that is, from such service industries as information system and physical distribution, and that VE keeps finding new areas of application.

What are major areas of VE research?

Current emphases in Japanese VE research are being placed on " Technical factors of VE application" and " Specific application of VE."

Research of technical factors covers the area of efforts as improving specific techniques such as function analysis, cost analysis, creativity and evaluation.

Research of specific VE application methodology encompasses finding specific ways to apply VE to products, business, manufacturing processes, construction processes, etc., and designing best VE approaches to new product development, cost reduction, productivity enhancement, energy-saving, and organization development.

The trend of VE, as described above, seems to reflect an ever widening coverage of research themes as the purpose of VE application has kept becoming diversified. Stronger emphases have been placed on technical factors of VE application so that VE can be more effectively applied to help accomplishing objectives and targets, and to a wide variety of VE research themes and objects.

Comparing the above trend data with American data, however, one can say that Japanese percentage of papers dealing with human elements is notably lower than that of the American papers, and that there are no papers dealing with " Promotion and enlightenment" on Japanese side. Yet, the fact that 42.2% of all Japanese papers surveyed are case reports or success stories would help filling the statistical gap under the category of " VE promotion and enlightenment."

CONCLUSIVE REMARKS

In describing the Japanese VE state of the art, this paper concentrated on illustrating the characteristics of VE application. VE has been applied mainly in private industries, such as manufacturing and construction sectors. Research of VE application has placed emphasis on " Technical factors."

Both the types of VE-using organizations and areas of VE application are growing. For instance, VE contract systems have been adopted in the public construction sector in the first half of the 1990's. Also, an increasing number of Japanese government and public organizations have begun adopting VE programs. Also, VE application in the services sector is being spread and producing beneficial results.

It is expected that the above mentioned trend would stimulate diversification of research activities to help achieving higher accomplishments of VE application.

As we realize that human activities on the part of corporate people from top management, managers and through all levels of value practitioners are essential to bringing up VE accomplishments higher, an equal emphasis should be given to " human elements" as on " technical factors."