VE AS AN EFFECTIVE TOOL FOR BUSINESS IMPROVEMENTS

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He has presented papers on Value Engineering at both national and international VE conferences. He presented a paper titled "Value Engineering in Capital Expenditure Projects" at AACE (Association for Advancement of Cost Engineering), International Conference, held in June 1998 at Cincinnati, Ohio.

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ABSTRACT

This paper describes how the role played by Value Engineering Program in one of the divisions of major organization in India was crucial, when competition from MNCs, shrinking domestic market were becoming threats to the very existence of the organization.

It discusses how the focussed VE program resulted into Business Improvements to the organization. It also shows how critical success factor like "Cross Functional Team" was taken care of, when very senior people are involved in VE program. Now Top Management finds it very useful to use VE program for taking major decision, which involves a lot of money, efforts, time. This paper will be useful, specially for south Asian countries, where culture and various situations are different than those in developed countries.

INTRODUCTION

Even though, Crompton Greaves had practiced VE methodology in most of the divisions nearly for a decade, the expected success was never experienced. Benefits were not found to be commensurate with efforts, precious time spent and money invested. Also, with rapid change in industrial scenario in the country, there was an urgent need felt, to use some of the proven methodology like VE for improving business. With a directive from Divisional Head, we tried to use VE in Transformer Division as a platform from where; improvements in business could take off.

This paper illustrates how various constraints like;

i) Competition from MNCs (Multi National Companies), who are armed with better technology, experience, vast funds, etc.

ii) Shrinking domestic market:

are tackled during administration of VE program. Also, it can be seen how VE methodology proved more effective, when used in conjunction with other techniques.

There are typical situations which prevail in South Asian countries like India e.g. in most organizations powerful labour unions exist, hence a strong labour union needs to be convinced

thoroughly, so as to ensure their co-operation during the progress of projects.

It was realized, how important it is to be competent and resourceful when you facilitate VE project team, involving seniors in the organization.

Some techniques like "Force Field Analysis" not only generate an interest but also ensures proper assessment of implementation proposals. When VE teams, comprising of senior members, VE coordinator has to ensure that their expertise is used to maximize the contributions, by his own personal commitments of very high order towards VE movement. With that, there is little chance of failure, because commitment from seniors percolates down at every level. Hence, a large population of non-members too participate in VE activities, with the result, organization can reap rich dividends.

BACKGROUND

Our organization, Crompton Greaves (CG) is one of the foremost companies in the field of electrical business in India. CG has nearly 13,000 employees, working in 26 plants at various locations, spread all over India. CG is considered as one of the leading organizations, which are in pursuit of continuous improvements. Hence, many improvement measures like; Quality Circles, Value Engineering, Business Process Re-engineering, JQI (Juran Quality Improvements) are practiced in CG plants.

The firm belief in systematic Value Engineering methodology by Mr.Ranjan Dasgupta, Member Board & President, Power Systems Group and convener of VE movement in CG, prompted senior management of my division to explore the possibility of major contributions out of VE projects.

This belief in VE methodology resulted into a favourable situation, when our entire senior management team consisting of many veterans in their respective fields participated in 40 hour VE Module-I Workshop (as prescribed by SAVE International). With such "Hands On" experience, they could use functional competence to the fullest extent.

PRESENT SCENARIO

Radical changes in the world greatly affected the strategies of almost all major organizations in developing South Asian countries like India. The entry of global players with superior technology and better infrastructure compel these organizations to look for various ways to beat this threat. Hence, organizations started looking for different approaches like Quality Circles, BPR, Kaizen. All these approaches are no doubt very effective and proved to be beneficial to them depending on the culture and prevailing situations e.g. BPR is required once or twice, every five or six years, to cope with major changes, which necessitate restructuring of processes, systems and even management style. One is well aware that such drive cannot be undertaken on continuous basis. Quality circles is very effective for improvements on the shop floor, reason being involvement in QCs mainly come from shop floor workmen.

VE is also thought of, as one approach in my division for improvements in business results.
It is well known fact that organization cannot work without focus and the number of areas for such focus must not be more than three or four.

We decided to have a major focus on VE activities in the division and decided to adopt systematic VE job plan for improving bottom line and reduction of manufacturing lead time. For this, we selected an export order which was bagged by us, worth nearly Rs.350 million and consisting of 22 nos. of large power transformers. There were major constraints in the path of completing this task. These constraints could hamper our prospect of completing this order successfully:

CONSTRAINTS

A) Competition

A stiff challenge was posed by MNCs in case of manufacture of large power transformers. Not only, they have experience, technology but also vast funds. Some MNCs have started operations in India after our government's liberalization policy. Also, there are local manufacturers which over the years have become well experienced and competent. With less overheads, they also pose a serious challenge to organization like ours.

B) Domestic Market

In the past few years, there is a lull in the power generation in entire country. Hence, there is not much demand for power transformers. With such shrinking domestic market, a manufacturing division like ours with a large installed capacity to manufacture transformers is in trouble. Medium sized manufacturers of transformers can afford to quote at much lower prices and still be profitable. This was also a major setback to our business in this sector.

C) Government Agencies

Our major customers are State Electricity Boards. With some state governments in India facing shortage of funds, delay the payments, which result into cash starvation. Unlike many other products, transformers is a material intensive product where major materials are required to be imported. Hence, such delay in payment severely hamper manufacturing of transformers on schedule.

D) Labour Unions

In countries like India, Workers' Union is a major force. This force is to be handled very carefully, otherwise it can upset your calculations or expectations. At the same time, if handled properly, it can serve as a "booster" to your business and will play a part of "family member" in the organization.

E) Paradigms of Seniors

It is a common experience that most of the seniors who are functional experts in their field are not able to accept many new ideas suggested during various group activities. This often results into conflict, which many a times threaten the objective of organization.

The following case study will illustrate, how these constraints were tackled, during VE programme:

I) STUDY OBJECTIVES:

VE project selected was a 90 MVA transformer for export order.

The following VE study objectives were identified by top management of division. They are:

* Identify areas; where there is a great potential for reducing costs.
* Identify those manufacturing processes which greatly affect total cycle time of manufacturing.
* Utilize skilled labour effectively.
* Strive to maximize synergistic effect from expertise in various fields, available with seniors.
* Improve aesthetics to a level of other world class manufacturers.
* Involve other employees of the organization.
* Create customer confidence to get further business.

II) METHODOLOGY:

VE Team:

VE team, consisted of senior managers who were heads of departments like; Technology, Export Marketing, Manufacturing, Design, Quality Assurance.

This team was led by Senior General Manager of Technology Cell. This team was facilitated by VE Coordinator (author himself).

Information Phase:

During initial meetings of VE team, objective of meeting was kept as "familiarization of VE team members with the project in preparation for workshop". Subsequent meetings were held primarily to compile all available information regarding various costs (material, labour, special processes, overheads, quality related costs, etc.). Also, competitors' data was collected from different sources.

III) MODULE I WORKSHOP

5-Day VE Module-I workshop was conducted (as prescribed by SAVE International) under guidance of certified value specialist (CVS).

During this workshop, functional analysis phase, creativity phase, evaluation phase and recommendation phase were completed.

In function analysis, FAST diagram was prepared (see Figure-1). Preparation of this diagram gave VE team members a clear understanding of the project under study. Also each member got additional knowledge about other aspects of business e.g. team member from export marketing had given the first hand information about various features of transformer, manufactured by leading world class suppliers. This information was found to be useful for designers.

Function cost worth analysis for all components of transformer revealed potential value improvements (one sample is given here, see Table-1).

Table-1

Function Cost Worth Analysis

Function	Alloca-ted Cost "C" Rs.Lacs	Func-tion Worth "W" Rs.Lacs	Basis for Worth	Value Gap C-W
Provide Core	31.50	27.81	ABB & Hyundai	3.69
Provide Winding Conductor	29.25	24.41	BHEL	4.84
Insulate Leads	5.43	5.01	ABB	0.42

Here, we also tried to analyze value gaps in business costs, where cycle times, availability of winding man shifts were taken for further study. Earlier, our traditional approach was to focus all our attention to bridge value gap in material costs only.

In creative phase, we decided to have shop floor personnel as well as few members who were not directly concerned with this project for brainstorming session. This exercise really helped a lot, as many innovative and practical ideas were given by these members. In the past, we normally used to have brainstorming sessions with the VE team members only. This new approach created a data bank of many useful ideas, which might prove useful later for other ratings of power transformers.

After evaluating various proposals, a presentation on recommendations to top management was done on the concluding day of VE Module-I workshop.

IV) SALIENT FEATURES OF POST WORKSHOP ACTIVITIES :

Here, readers will understand, how constraints are tackled, during post-workshop activities in VE program administration and also new learning which were experienced during that journey.

Competition:

During FCW analysis & FAST diagramming, it was clearly understood by VE team members that competitors' mainly score over us in manufacturing cycle time. Hence, focussing on that value gap was vital. Cycle time of manufacturing power transformers largely depended on "winding time". Also, capacity of winding section was limiting factor. Therefore, that section was a bottleneck. Decision to procure costly CTC (continuously transposed conductors) for winding was taken when team analyzed the costs which might incur if transformer is despatched not on time. We realized this will hamper our export business too. By delivering first few units in time, on schedule, overseas customers' confidence in our capability grew up. It was then evident that we were in the running to get clearance for remaining units and it did happen. Today, we are on the right track to establish ourselves as an exporter of Power Transformers.

Reduction in manufacturing cycle time also helped to acquire a competitive edge, while quoting for other global tenders.

Government Agencies

Inability to pay in time by some State Electricity Boards, used to hamper our procurement of costly imported materials like; copper, CRGO steel, but VE team made it possible to despatch all units in time, thereby ensuring availability of funds from overseas customer. It was really a great boost to our business, as cash was available for procurement of materials.

Labour Unions

During the 5-day workshop, many workmen participated in discussions with VE team members. There were some sub-teams formed to facilitate implementation of recommendations. This transparency paved a way for better mutual understanding between Union and Management e.g. union committee members often instructed workmen to spare no efforts while implementing recommendations of VE team, since ultimately, those efforts were going to benefit business of the division.

Nearly 30% of our shop floor employees are conversant with 7 QC tools, thanks to well established Quality Circle Movement, few years back. During some meetings with VE team, shop floor employees used Ishikawa diagram (cause and effect diagram) for identifying causes related to problem.

Paradigms of Seniors

There were many occasions when senior members of VE team were not mentally prepared to accept new ideas or suggestions. But such conflict was avoided when VE coordinator used to emphasize the importance of following the process of VE job plan and basic rules of team work in SGA (small group activities). VE coordinator used to arrange a meeting, where external experts who had tried some suggestions in their work place, were invited. This interaction, often used to lead to acceptance of each others ideas. Over the period of time, there was quite a good amount of positive relationship developed between seniors. This was further strengthened by regular monthly review of VE activities by divisional head.

The main features of review by Divisional Head were:

Regular frequency :- reviews were held for two hours in first week of every month. Hence, seniors were always making their plans so as to keep time for this review.

Structured agenda for review was another feature, where meeting was conducted with specific agenda, which reduced a lot of "out of context" discussions.

As seniors were "triggered" with VE approach, they used to come to attend this review meeting with all preparedness. Valuable experiences shared by experts, added tremendous value to available knowledge with experts.

Recommendations which were found to be beneficial to our division were considered for applications in other divisions. For this a separate high level meeting of senior designers was held to explore possibility of "Unification of design practices" for all the remaining plants in the country". This synergistic approach helped to cut down wastes and adopt good practices for the organization.

We realized that paradigms of senior managers was getting slowly changed so that the acceptance of new ideas got the momentum. In fact, cross function team of such experts with positive approach to attain the end objective was critical success factor of our VE program.

Improvement in Business

Fulfilling overseas customer's requirements like quality parameters as per international standards (IEC); delivery as per committed schedule was a great challenge to the organization. VE team not only proved that their combined competence was very important but also that VE, if followed systematically would certainly give results. This result into an export share rising to 51.5% (from about 10% earlier) and also, assuring further orders from other overseas customers. In fact, that year nearly 89 crores worth of transformers were exported out of total sales of 160 crores.

Logistics

This does play a vital role, when you deal with overseas customers. To load certain number of transformers on a ship, VE team tried to achieve compactness of total transformers so that transport from Works to Port became convenient and economical.

Use of Force Field Analysis

This technique developed by Kurt Levin, for diagnosing situations was found to be very useful before implementing certain major proposals. This technique analyses the situation by discussion among group members, by identifying driving

forces (facilitators) and restraining forces (barriers) that influence any change that my occur.

Many such situations, were analyzed by this technique. One example of this is shown here: (See Table-2)

Table-2

Force Field Analysis for use of Continuously Transposed Conductor

FACILITATORS	BARRIERS
Reduction in manufac-turing cycle time	Higher Cost
Improves Quality	To be Imported
Improves Electrical Losses	Higher Lead Time
Helps to adhere to committed delivery	

When these factors were discussed across team members, a proper diagnosis of situation was possible. Hence the possibility of taking right decision increased. Use of this technique really motivated some seniors to the extent that in some departments like facilities head of department analyzed pros and cons of procurement of certain equipment by using FFA.

CONCLUSION

When CEO of a big organization is convinced about effectiveness of final contributions of an age old technique like VE, other heads of departments, slowly gets convinced. But real joy comes when they themselves participate with an objective and after a prolonged efforts, come out winners.

To secure profits, it is very important to implement business plans that center around profit plans. Hence, like in above case, VE program was carried out to link those business plans. Also, by establishing a goal of achieving a major market share in exports by effective use of VE program, our division was able to communicate and carry out its intended plans.

During the process, d. ision as a whole focussed on improving product and service quality and organizational constitution was strengthened.

These efforts resulted into breaking down of sectionalism, improving communications, removing inter departmental barriers. As many employees were involved in VE program, each employee had learned to see things from business view point of an organization.