

KEY FACTORS IN STARTING AND MAINTAINING A VA/VE CONTINUOUS IMPROVEMENT PROGRAM

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John H. Maurer was part of the start up team at the Westinghouse Productivity and Quality Center (WPQC) in 1981. Over the next eight years he helped make the WPQC a World Center of Excellence for refining and applying productivity and quality improvement methodologies. As Manager-Value Projects, Mr. Maurer organized and lead over 100 multi-discipline task team Value Engineering (VE), Total Quality and Product-Process Integration programs. He lead divisions in the start up of ongoing VA/VE programs including the training of division Value Managers and Facilitators. Mr. Maurer is not only innovative in adapting VA/VE principles and techniques to varied applications but also knowledgeable in the vast array of other productivity and quality improvement tools/methods, such as Total Quality, Simultaneous Engineering, Design for Producibility, Just in Time, Process Mapping, Cost-Time Management, etc.

ABSTRACT

This paper presents an outline of key factors in setting up a VE/VE program and in conducting VA/VE team workshops on a continuing basis. These include subtleties, learned from experience, that contribute to success. I share "lessons learned" from WCPQC experiences starting VA/VE programs in divisions and illustrate with a case study.

"Competition Management for the 1990's"¹ discusses that problem in detail and concludes that VA/VE is the key methodology to tie together the many tools/methods of Productivity and Quality Improvement. The result is a systems approach to business improvement utilizing VA/VE as the structure and core methodology but drawing upon the other methodologies as appropriate.

Given a VA/VE based systems approach to business improvement the next challenge, in sequence, was how to establish it in the operating units (divisions) in such a way that it will be an ongoing continuous improvement process.

INTRODUCTION

When the WPQC started up in 1981, our first mission was to collect productivity and quality improvement methods being used across Westinghouse and elsewhere, plus inventing a few new ones. We were so successful that we created a substantial problem. There were so many that we were forced to resolve questions of: How do we make sense of these? Which do we apply where? How do we make them compliment and reinforce one another rather than compete and detract from one another?

During the next 8 years, over 200 VA/VE studies were completed across Westinghouse. Most were conducted at divisions with WPQC assistance. Many were done by divisions on their own after help getting started. In one year alone, I conducted 10 programs for 6 divisions resulting in over \$12 million of implemented benefits. VA/VE was instrumental in the business recovery of 2 divisions. A continuous improvement program combining VA/VE & TQM was established at the Westinghouse Commercial Nuclear Fuel Division which contributed to their winning the first Malcolm Baldrige National Quality Award.

The ultimate indicator of “doing things right” during this period involved other factors but, no doubt, the WPQC working with divisions made a major contribution. Westinghouse Electric Corporation was #1 among the Dow Jones Industrials in “return on shareholder equity” for the entire decade of the 1980s.

VA/VE became ongoing in some divisions, but not so in others. Here is what we learned from the experience.

KEY FACTORS IN SETTING UP A VA/VE PROGRAM

Over the years, a list of key factors in setting up a VA/VE program was developed.

It is very important to evaluate the climate for cultivating an ongoing VA/VE program. Larry Miles had faced the same task years earlier of establishing Value Analysis (VA) programs in divisions of General Electric Company. Larry once told me, “John, there are two factors which will cause a business manager to espouse Value Analysis. One is a rare degree of foresight. The other is panic.”² The most important point is that there needs to be a genuine desire on the part of the responsible managers.

Personnel must be identified to fulfill three separate functions. A person can fill multiple roles but generally these are separate.

Management Sponsor

Management sponsor(s) must be identified which will oversee the program. This can be an individual such as President or General Manager. It can be a group such as Management Committee, Quality and/or Productivity Committee. This sponsor should have business wide responsibility and authority and be genuinely committed to the program including personal involvement in certain aspects.

This oversight body provides motivation and funding, evaluates the value improvement proposals and makes decisions on implementation.

Value Manager (VM)

The VM receives direction and objectives from the management sponsor, organizes the VA/VE workshops and administers the program. When

properly trained, the VM will take the lead in using business analysis techniques to identify projects for value analysis. The VM tracks and reports the value improvement progress.

Workshop Facilitator

The VA/VE Workshop Facilitator instructs the team members in VA/VE principles and techniques and leads the team(s) in applying them to their specific project. VA/VE Facilitator is a multi-faceted role requiring a blend of these abilities.

- In-depth knowledge of VA/VE principles and methods.
- Experience in how to adapt and apply VA/VE techniques to varied situations.
- Sense of where to search for and how to uncover hidden improvement opportunities.
- Good group presentation skills.
- Ability to manage the dynamics of the multi-discipline team, foster balanced participation of team members, coach and guide them without being viewed as a source of solutions.
- Understanding of creativity and skill in stimulating the creative output of the study team.

Some businesses find it simpler and more effective to use external professional VA/VE facilitators (consultants) or, in the case of a Westinghouse division, using a corporate WPQC facilitator.

Others desired to develop their own internal facilitators. In the later case, the internal facilitator candidates are trained along side the professional facilitators for several workshops before going on their own. In Westinghouse, we developed a “Train the Trainer” program to prepare internal VA/VE facilitators. This consisted of training materials and side by side training with progressive handoff to the internal facilitator. When training is completed, the internal facilitator(s) conduct workshops on their own but can call upon the professional facilitator if/when unusual situations arise.

Integration and Objectives

Many companies already have some

improvement programs such as concurrent Engineering, DM, TQM, JIT, etc. In such cases these programs should be integrated under the banner of improving value and competitiveness. Program objectives should be established which are directly supportive of business plans. A key to success for the VA/VE program is to have it support already established business goals. The ideal situation is for senior management to view the VA/VE program, not as "something else to do", but rather as a means to help them achieve goals for which they are responsible.

A word of caution, however. Avoid an overemphasis on cost reduction as a sole measure of a VA/VE program. Truly cost improvement is a primary reason to conduct a VA/VE program but keep in mind that "Value" means reducing cost while retaining quality and customer satisfaction. The pitfall to be avoided is that measuring only cost can lead to a cheapening of the product which will undermine support for the program. This has led to the demise of VA/VE in some businesses.

Plan for Implementation

Now is the time to think about implementation. **"Implementation: Too Often the Forgotten Phase"** emphasizes the importance of planning for implementation from the very beginning³. A plan must be documented describing how value improvement recommendations are to be evaluated and allowing for resources to be available to implement approved recommendations. The plan should include the sponsor's regular review of progress on implementation of approved recommendations.

Organizational Support

A VA/VE program, even more than other improvement programs, requires cross-organizational support. It cannot be an engineering program or a manufacturing program. It needs to be a program for business improvement of which all organizational elements have a part and commitment.

Once the VA/VE program objectives, personnel, structure, and commitment are in place, it is time to think about projects.

KEY FACTORS IN CONDUCTING VA/VE TEAM WORKSHOPS

The preceding items are done once in setting up

the overall program. The following items will be done repetitively for each project/workshop. The proper sequence is to identify the VA/VE project first, identify the proper people to staff the VE study team second and then schedule the actual study/workshop.

Project Selection

It is important to start out simple and then move to more sophisticated projects. The VA/VE study projects are usually identified in one of two ways, either by management insight or through the use of business diagnostics.

For each project it is imperative that the specific objectives and scope be clearly stated and understood. Support for the program can be maximized by selecting projects which tie into the strategic and business plans, to Total Quality goals, and to improving Value of the business.

Although VA can be applied to almost anything, typical projects are products, production processes and/or information processes which have a combination of the following problems.

- High Cost; resources consumed and costs are higher than desired.
- Functions (needs) are not being properly accomplished; suspect redundancy or unnecessary functions are consuming resources and adding unnecessary cost.
- Repetitive problems; multiple "bottlenecks"
- Waste (time, effort, money, material)
- Unjustifiably complicated or time consuming.

Team Selection

Once the project is identified along with its objectives and scope, the study team should be identified with multi-disciplined team members representing the elements of expertise necessary to address the project. A team leader should be designated. The following points should be considered when selecting the VA team.

- Ideal team has five members from varied departments with backgrounds and expertise necessary to fully address the project.

- Team members should be capable, respected and able to obtain support of their department.
- Team should have a mix of people with intimate knowledge of the project (able to look at trees and leaves) and people with a distant unbiased viewpoint (able to look at the forest).

Data Collection

Project data for analysis should be collected well in advance of the workshop. The VM, the facilitator, and the team leader work together to identify the data that is required. The nature and extent of the data will depend on the project and the objectives but typically includes information on cost, resources consumed, cycle times, suppliers and any known problems. Customer/field data may also be required. The team leader has overall responsibility to see that the data is collected but may delegate the actual collection to various team members.

Workshop Preparation

The VM and facilitator work together on workshop preparation. Arrangements need be made for the following.

- Location/meeting facilities
- Equipment
- Letters of Invitation
- Organizational Support
- Resources including implementation
- Manager for kickoff
- Management for presentation of results

It should be emphasized to the workshop team members and their managers that the workshop is a full time commitment. A VA/VE workshop is a contiguous process. It cannot be effectively done part time. Participants as individuals and as a team need to focus their attention on the project without having their thoughts interrupted by other commitments.

The Workshop

The workshop itself should be kicked off by the sponsor or other senior manager. His/her remarks should explain the importance of the project to the business and state senior management's willingness to

evaluate new and different ideas. The sponsor then turns the workshop over to the facilitator.

The facilitator explains the value principles and leads the team or teams through the VA job plan starting with the Information Phase. Resource analysis and Function analysis lead to the identification of opportunity areas which become targets for creativity. During the Creativity Phase the team generates a large quantity of raw, unjudged ideas which are analyzed to determine which are worthy of development. Selected ideas are developed and packaged into proposals. Proposals should include the anticipated impact on costs and other value parameters. The resources required for implementation should be estimated and an implementation plan made. Thought should be given to which proposals could be packaged together for a synergistic effect.

Management Review and Decision

At the conclusion of the workshop, the team(s) make an oral presentation of the results to the sponsor and other interested managers. They submit their documented recommendations to the sponsor/oversight body for review. Managers involved should realize that the ball has been passed. They gave an assignment to the team. The team applied their analysis and creativity to come up with the recommendations. The managers now have the responsibility to promptly, thoroughly review the recommendations and report their decisions to the team. Management decisions should take one of three forms: either "yes" meaning to proceed with implementation, "no" with the reason why, or "I like it but here is a concern. Go back, study this element of concern and then report back to us".

Implementation

Approved recommendations go into the implementation procedure which was established back in the setup phase. Sponsors should hold monthly implementation progress review meetings. Those responsible for implementation report their progress and problems. The paper "**Implementation: Too Often the Forgotten Phase**"³ describes roadblocks that will come up during implementation. When, not if, roadblocks arise the team will be able to solve some but not all. Management involvement will be necessary particularly in cases involving political and/or resource allocation matters.

It is important for management sponsors to

realize that implementing value improvements can be very frustrating work. An important role of the sponsor is to support and encourage those working on implementing Value improvements. Finally, recognize and reward success.

Repeat Procedure

Project selection is an ongoing process. As soon as the first project moves into implementation, the next project and workshop should be taking form. Return to the beginning of this section and recycle through. When this is done on a continuing basis, a continuing stream of value improvement recommendations will be going into the implementation process and generating savings and other benefits as they become implemented.

Points for the Long Haul

Over time you will generate Value improvement recommendations which are good ideas but the time is not right. There may not be resources available to implement or they may need to wait for a model change or extensive redesign. Establish an "Idea Bank" of improvement ideas which are not currently implementable. Make sure whenever redesigns or model changes are considered, that the Idea Bank is reviewed for improvements that should be incorporated.

There is one last but important point for a continuous value improvement program. I attribute this point most to Art Mudge, Vice President of Joy Technologies (retired)⁴. The point is to track and record the implemented benefits of all value improvements. On several occasions, due to shifting priorities or changing management, Joy's value program was questioned or proposed to be eliminated. Art emphatically stated that the VA/VE program survived business and management changes because in each case he had well documented records of audited savings proving the value of the VA/VE program. Tracking and documenting benefits over time gave the program it's longevity.

FACTORS TO AVOID

There were also cases where VA/VE programs started but did not continue successfully. A list was created of factors that can lead to the demise of VA/VE programs, in the hope that it could be used constructively in planning for success. The following are negative factors.

- Internal facilitator "moves on". This role requires specialized skill and training and is, therefore, harder to refill than other positions.
- New management wipes out programs associated with prior management. They may feel that they would not "own" it's success.
- Losing sight of "Value". Cutting cost in ways that cheapen the product or customer service.
- Overstated savings leads to lack of credibility.
- Lack of Implementation. VA/VE workshops, improvement ideas and estimated benefits can be exciting but implementing changes is frustrating work. It inherently involves swimming against the current of status quo. Unless the management sponsor(s) are committed and involved it won't happen.

A CASE STUDY

The Westinghouse Canada Motor Division was one of my VA/VE clients at the WPQC. They desired to establish an ongoing VA/VE program at their Hamilton, Ontario plant. With my guidance, they set up the program structure as described earlier. An individual was identified to become their internal VA/VE workshop facilitator. He came to the WPQC in Pittsburgh for the intensive "Train the Trainer" initial training. One of the final steps was for him to conduct a workshop, mostly on his own, but under my direction.

We were planning to do a simple project but his senior division management had a business need for a VA/VE study on a very complex but urgent and important project. The issue was the overall manufacturing cycle time for motors. They were losing sales because of being non-competitive for cycle time. I traveled to Hamilton to assist with the planning and setup of the workshop, although my objective was to have them do as much as possible themselves.

The project was divided into two parts and a team identified for each. One team studied the manufacturing process on the factory floor and the

other team studied the process of developing manufacturing information and integrating it with the manufacturing operations. The scope was all activity from receipt of order to shipment of the motor. The local facilitator conducted the workshop under my supervision.

The program was so successful that the division won a Canadian National Productivity Award. They cut the cycle time from order entry to shipment in half. Although not a requirement, they also significantly reduced product cost. Furthermore, a capital program to expand the plant was no longer necessary due to the efficiency of producing motors in half the time. They could meet capacity without additional bricks and mortar. This project can be seen in more detail on the video tape *Value: The Success Criterion*⁵ available through the SAVE bookstore.

This success on a subject of intense management concern generated a commitment across the organization for the ongoing VA/VE program. It also inspired other divisions to develop VA/VE programs.

The Westinghouse Canada Motor Division continued to do VA/VE entirely on their own and just send me summaries of their results. Some other divisions which established successful ongoing VA/VE programs were the Westinghouse Commercial Nuclear Fuel Division in Columbia, South Carolina; Westinghouse Defense Electronic Systems Center in Baltimore, MD; Thermo-King in St Paul, MN; and Westinghouse Elevator Company (continuing as Schindler Elevator Company) in Morristown, NJ and Gettysburg, PA.

CONCLUSION

Starting and maintaining a VA/VE continuous improvement program, although not easy, is definitely achievable and worth doing. The lessons learned from our experience should save effort spent reinventing the wheel. The sequence described above along with foreknowledge of pitfalls and success factors will help greatly in planning and reaping benefits from a VA/VE continuous improvement program.

REFERENCES

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