

A Systemic Approach for Improving An Organization - That Makes a Difference to the Customer -

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A systemic and humane approach for improving an organization that makes a difference to the customer and provides a lasting effect is difficult. Such a system has three components: 1) how a product or service is delivered, 2) the product or service design, and 3) a management system to enable improvements.

A definition for business or organizational success is to fulfill a need, either societal or individual, stay in business, and provide jobs in the future. Sounds easy, and if done correctly an organization can succeed in the short term. However, long-term success requires a dedication to constantly scan the environment for new opportunities, to predict the customers needs, and find new ways to provide products and services.

Intertwining product requirements, process requirements, and human behavioral norms into a systemic approach for improvement is difficult. Where do you start? Bottom-Up and Top-Down approaches each have special commitments and produce results at different speeds.

Bottom-Up approach begins with production, creating quick results, both in the short-term financial health of the organization and to the operational efficiency. Financial returns can be verified relatively quickly and are quantifiable. Profit and Loss statements show the effects in a few months or quarters.

The caveat of focusing on the financial gains of improved operations is that other inefficiencies in the organization remain hidden. Organizational inefficiencies that, if improved, would provide greater financial

returns on investment. Product design improvement is one area that provides very good return on investment. How do we satisfy the customer's current needs differently than what we currently offer? Another area that falls under this caveat is management practices. Inconsistencies between policy and strategy, mismanagement of people, and governance practices can create heavy losses, possibly the heaviest losses.

Top-Down first addresses management practices. It is a more difficult route. The results are far greater. However the financial results take longer to become visible. This approach is working on the infrastructure of an organization, the very foundation created to support all efforts. The scope of change is broad and the separation between cause and effect is great. When the efforts are well done, the visible effects are subtle. Changing the alignment between policy and strategy is time consuming and sometimes gut wrenching for individuals. People's behaviors take time and practice to adjust to the new environment.

Let's explore a few concepts of improvement in the three areas of: production, design, and management.

Process Improvement

The reality for fulfilling the needs of the customer consists of an overwhelming number of factors. Requirements are imposed from multiple sources or customers, each with their own needs and wants. As requirements are cascaded through the organization, the requirements

are translated into actionable items. Sometimes with clear connections, sometimes the connections are not obvious. Some benefits are immediately obvious and some benefits are obscure to the local workforce. Each requirement has ramifications far beyond the immediate area.

Many Process Improvement methodologies are created to improve operational efficiency and effectiveness. Each provides a disciplined approach for improving how a product or service is delivered. Their primary technique is to expose incongruities in the execution of tactical plans, bringing into the open some of the assumptions and misdirected focus of dedicated professionals.

Once incongruities are exposed and understood, people inherently strive to correct them. No one deliberately creates unnecessary work or bad quality. Most processes are created with the best of intentions, focusing on performing the task at hand, with the resources at hand, in the environment where they exist.

Looking at one methodology to expose incongruities, Lean focuses on exposing wasteful activities so they can be removed. 'Eliminating Waste' is the catch phrase used. Waste being defined as any activity that consumes resources without creating *value*. Lean begins by identifying what activities create value in the product, from the standpoint of the customer. Value is frequently defined in practice by asking 'if the customer would be willing to pay for that activity'. The more precise definition of value is meeting the customer needs at a specific time for a specific price. Once various value added activities are identified, non-value added activities are minimized and/or eliminated where possible. Value added activities are sequenced into what is called a Value Stream. Emphasis is placed

on making the activities Flow, like a river. Now efforts turn to letting the customer Pull product or service through the process. Making the process responsive to providing the product or service only when the customer needs that specific product or service. Not before, not after. With the new knowledge, the process is repeated indefinitely, striving towards perfection, or at least adopting the mindset of constantly reevaluating activities for improvement.

One of Lean's most powerful tools for exposing incongruities is described in popular literature as a 'Value Stream Map,' or by its more traditional name of 'Material and Information Flow Map.' Similar in appearance to a standard process flow chart, a VSM shows the product flow and includes information flow triggering each process.

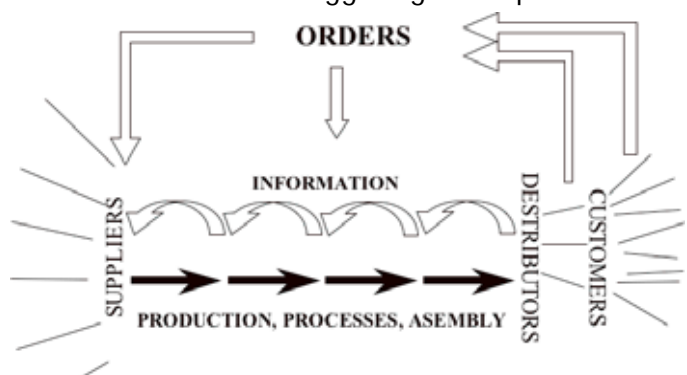


Figure 1, Value Stream Mapping Adaptation

These maps are created by starting from the customer end of the process, then following the process upstream to the raw material.

You can see the roots of Value Stream Mapping in Dr. W. Edwards Deming's Production Viewed as a System (1). The main difference being several decades of time.

From a map of an existing production system, Process Improvement ideas are generated. Lean uses many tools and

techniques for implementing those new ideas.

Numerous other process improvement methodologies are available and they are known by many names. Most use a structured approach to understanding the existing conditions, generate improvement ideas, then implement the changes. The scope of the project changes according to the needs of management or the project at hand. Six Sigma focuses on a deep dive investigation in a tightly defined project, directed towards reducing variation. Theory of Constraints focuses on a shallow dive into the broader scope of improving throughput. The choice of improvement methodology is primarily based on management and workforce acceptance.

Many process improvement methodologies begin by assuming the product or service is designed in the most economical way to satisfy the needs of the customer. They also assume the current product or service fulfills the functional requirements of the market and the customer.

Once the processes are defined, refined and behavior understood, some methodologies go another step to look at how the product or service is designed. First by looking at design features that can be changed to facilitate production. Then processes are mapped to design requirements, and in certain instances, further mapped to the needs of the customer.

Each of these process improvement methodologies look at the product or service through their own respective theory and tools. However, their particular perspective may or may not satisfy the customer needs.

Improving operational efficiencies increases productivity, which in turn, decreases operational costs. The time delay between

process improvement and dollar savings is short. Process improvement efforts can result in a net improvement in the organization's bottom line very quickly. However, sustained financial gains may be fleeting, as the market is constantly changing. A company could end up with the most efficiently and effectively produced product that nobody wants.

Product Improvement

The design activity consumes five percent of the product cost, while it has a 70 percent influence on the final cost. On the other hand, material and labor costs can consume 65 percent of product costs, while only influencing the final cost by 25 percent. Where would you invest your capital and human resources to produce the largest return: Improving the 25 percent influence on product costs, or the 70 percent?

Value Engineering (VE) has been evolving for the last 60 years as a way to remove unnecessary cost from the product design before, during, and after the fact. This approach is slightly different than Lean. Many times 'Eliminating waste' is subject to local definitions, frequently carrying emotional baggage or uses a limited perspective. The VE approach is more emotionally neutral, a result of a study, allowing for interpretation.

The process transcends corporate cultures and uses language that goes past emotions, to the heart of the issue. This approach first identifies the intent or function and understands the context, THEN develops alternatives and implements a plan. Value Engineering studies bring marketing, finance, operation, design, customers and suppliers together to systematically explore how the product performs the function the customer needs. An interesting part of this

investigation is that cost of implementation can be associated with functions. This comparison can be an analysis of the effectiveness of implementation. When marketing and customers know the cost of specific functions, they make informed choices about the configuration of the product or services.

Modern day Value Engineering originated at the General Electric Company during World War II as Value Analysis. Lawrence Miles, a GE engineer, was made responsible for determining how to produce hardware for the war effort, despite shortages of key materials. He approached the problem by identifying what functions the hardware had to perform, and then exploring alternative ways of providing those functions.

Lawrence Miles outlines a structured process that consists of defined steps called a "job plan," which includes the identification of what the market furnishes and needs, as opposed to the producer's perception of what the customer wants, and defines the priority of requirements. His approach is based on a few deceptively simple questions: 1) What is it? 2) What does it do? 3) How much does that cost? 4) What is it worth? 5) What else will do that? 6) What does that cost? Very easy questions to ask, and many people are quick to answer. However, bring a group of people together from inside and outside an organization to answer these questions, and you quickly find a vast array of answers. Almost as many answers as you have people, each from a different perspective, each with different viewpoints and preconceived ideas. The underlying foundation of Value Engineering is to challenge the assumptions most people make about how the product or service satisfies the needs of the customer. Then rebuilding the product or service by identifying that the customer needs something **done**, they want an **outcome**.

Customers do not want a feature, they want a **function**. After all, it is the function that creates a benefit for the customer.

To Lawrence Miles' surprise, his alternative solutions often achieved the required functions with lower cost and/or higher performance. His approach to cutting costs and improving quality was so successful that the US Navy adopted his methodology and changed it name to Value Engineering. Since then, Value Engineering has spread to industry and government in the United States, Japan, and Europe.

In the 1960s, Charles Bytheway developed a graphical method of analyzing the dependencies between functions. A structured modeling approach that separates 'what' must be done (intent and ensuing functions) from 'how' we choose to do it (architecture). With this method, he was able to better identify a complete, non-redundant set of functions. His approach also allows control of the level of change by determining how far up the dependency chain alternative solutions were found. His Function Analysis System Technique (FAST) model has become a mainstay of Value Engineering. Both for identifying missing functions, redundant functions, and areas of low value; and also for mapping functions to organization's processes, products, events, and other systems.

In the early 1980s, J. J. Kaufman expanded the basic concepts of both these men's work, broadening the application of Value Engineering beyond the application of physical sciences into the area of resolving business problems and capturing business opportunities. He creating Value Management - An organized effort directed at analyzing the functions of goods and services to achieve necessary functions and essential characteristics in the most profitable manner.

Value Management determines cost generation and evaluates a range of alternatives including new concepts, reconfiguration, eliminating or combining items, and process or procedure changes. These elements bring marketing, engineering and manufacturing together to “take deliberate action to improve cost effectiveness.”

Value Methodology essentially separates INTENT from METHOD, thereby creating **clarity of thought**. This then allows the building of METHOD, based on INTENT.

Let us diverge a short while to discuss

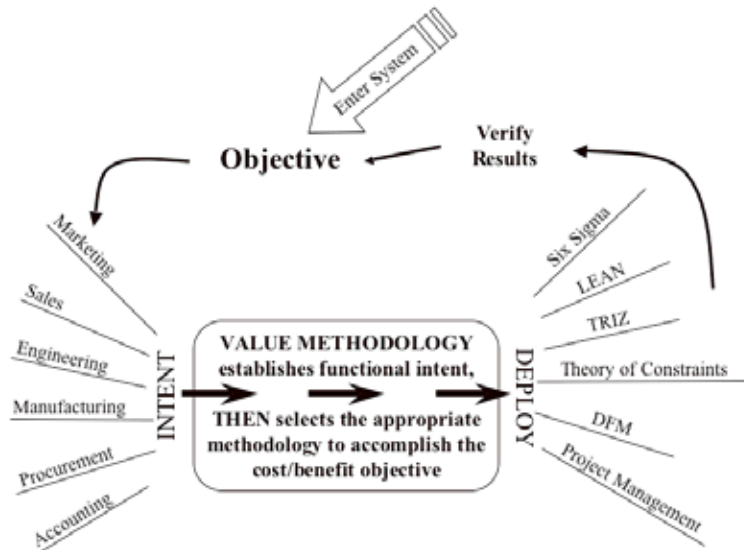


Figure 2, Value Methodology as a Management Tool

‘Value.’ We are talking about Economic Value, not political value, social value, judicial values, etc. LEAN defines value satisfying the customer needs, at the right price and at the right time. Value Management defines value in three elements: 1) Use or performance value – how well does it work, 2) Worth value – what is the purchaser willing to pay for the product’s function, and 3) Esteem Value – desire to own, e.g. a brand name. The ultimate value can then be calculated as Use,

Worth and Esteem, divided by the price paid.

Value Management’s definition is more difficult to define. However, it provides a robust description of value for the purpose of product design. LEAN’s definition, while also challenging to define, uses language well suited for the production environment.

Management Practices Improvement

All human activities and efforts of any organization are based upon management practices. Practices that govern how people interact within the organization, as well as, how people interact between the organization and the rest of the world. The practices may be consciously created and based on theory, or may have simply emerged as the organization grew and matured.

Management’s job in the area of improvement is to create and facilitate an environment for learning and cooperation. One area to start is to remove policies and barriers that inhibit people from doing a good job. At the same time, encourage communication between functional areas and different levels of the organization.

How can management accomplish this?

Remove or minimize any reward, ranking, rating, merit, incentive pay, and pay for performance programs. These programs institutionalize internal competition. The organization is not in competition with itself. Great losses arise from selfish competition between departments and individuals. The organization is a system, working together towards a common purpose. It must be managed as a system. Complete with managing the interactions and grey areas between system components.

Overcome the temptations to manage based on results or relying solely on numbers for decisions. Do not confuse coincidence with cause and effect. Managing by outcome does not improve anything. The same system created both the positive and negative outcomes. Only by improving the system can long-term, sustainable improvement happen.

Dr. W. Edwards Deming defined a system as a network of interdependent components working together to accomplish the aim of the system. Leaders must recognize and manage interdependencies, guiding efforts towards the common aim. How is this accomplished? By removing barriers, resolving conflicts, encouraging cooperation and communication between components.

Every component of a system has an obligation to that system. The primary obligation of each component is to contribute its best to the aim of the system, not to maximize its own production, profit, sales, or any other competitive measure. When recommendations are made for improvement, show how the recommendation contributes towards the aim. Identify risks, tangible and intangible benefits, and a plan. Possibly make recommendations that include risks, benefits and a plan for several scenarios. After all, a component may not be aware of all the factors involved with the environment in which it exists.

Keep an eye on long-term solutions and long-term efforts as well as changes in technology and markets. Of course take care of the emergencies and fires that arise, however only long-term solutions will keep the organization alive in the future. Keep reminding people of the larger purpose of the organization and the role of

improvement in the success of the organization.

Another aspect of management's obligation to improvement efforts is to encourage the exploration of data and theory. Finding the context for which data is used for improvement and how it helps align improvement efforts towards the aim of the system.

Data, information and knowledge are not the same. Data is just that, data. Measurements and observation counts are two examples. When data is placed in a context, information is created. Understanding how data is classified and interpreted based on the concepts in which it was created, along with how the data is used for action are just a few factors of converting data and information into knowledge.

People are different. Exploring how people interact with each other, with the circumstances of their environment, and with the systems, will help create an atmosphere of learning. People learn in different ways. Some learn by reading, others by listening, and still others by watching pictures, movies, or someone else. Don't be trapped by the idea that people learn by doing. People don't learn only by doing, despite what is advocated in popular literature.

Rewards and incentives have a negative effect to learning. People will only fulfill the requirements for training in order to obtain the incentive. Animals are trained by using rewards, people learn to improve their ability to contribute and make a significant difference to the group and company. Certainly show an appreciation for efforts and contributions. However, do not make that appreciation a reward or incentive. Telling people if they do something, then

they will receive an incentive, will only demoralize them.

In addition to managing the system, leaders will have to manage changes in the current system as well as anticipate change for future systems. Organizational growth and complexity are never ending. Anticipating future changes many lead to redefinition in the boundaries of system and components. Preparing for these changes may require imagination about the possibilities.

Creating a systemic approach to improvement

Process improvement, product improvement, and management practices improvement must work together towards improving the organization as a whole, working towards a common aim. Everybody doing their best is not sufficient. Functional areas of a system must be aware of how their actions impact other groups and the entire system. Each group must investigate to understand how their actions will benefit the whole, and identify the dangers of how their actions introduce risks to the whole. Also, each group may have to accept less than optimal performance of their functional area in order for the entire system to improve.

Selecting where to start is not a question of one area or the other. All three areas are co-dependent on each other. No group exists in isolation. Every organization is a system.

When improvement is begun in any single area, the first issues addressed are usually

the issues that can be corrected by the local workforce. However, as these immediate and local issues are corrected, new issues become visible. Issues that are beyond the scope of immediate influence. This causes conflicts as improvement efforts start to influence other areas. Between the unbridled enthusiasm of one area, and another area not understanding the reasons for the change, conflict arises. This conflict causes change efforts to have several adverse effects. First, it negatively affects the morale of people and organizations. Second, conflict leads to reduced performance of other groups in the system.

People are not against change, they are against *being* changed. People need to understand the need for change from their perspective. Functional work groups are not receptive to outside groups telling them how they must change. Communication and collaboration are the best way to overcome resistance. Management practices must provide an environment where people are given a voice in how change is going to happen and share operational definitions about each other's improvement projects. Using language that is common or easily understood by most people, without jargon.

The organization must learn individually and collectively. Only through cooperation and collaboration will collective learning take place. Collaboration in pairs is an interim step. Eventually, production, product design, and management practices will need to work together.

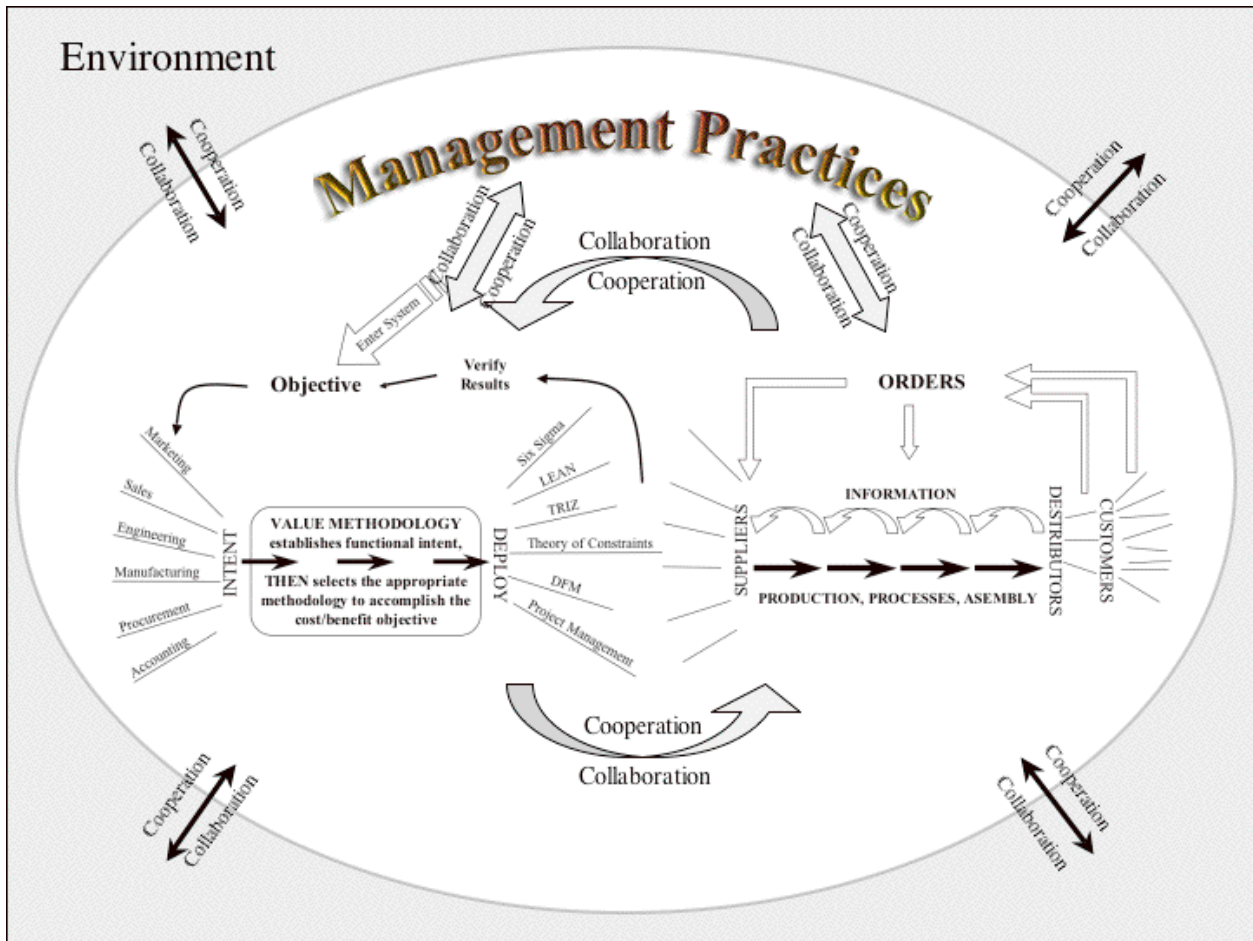


Figure 3, A Systemic Approach to Improvements

Conclusion

While process improvement will produce results quickly, those results are transient and often only include the short-term future. Product improvement can produce greater results than process improvement. However, those results take longer to realize. Improving management practices produces the greatest results, however those results may take years to realize, are the most difficult to accomplish, and many of the results may be indirect. Behavior is the hardest thing to change, in ones' self and as a group.

Caution: there is a popular belief by many improvement advocates that people outside the area will 'see the light' and change if

you show them the results of improvement. This is a myth. Don't believe everyone will automatically accept and adopt any methodology once it is 'proven' through improved performance. The system will adapt, nothing more. And the system will adapt only enough to alleviate the pain that your project is causing. Even then, adapting will only happen as a last resort, when no other option is available.

Improvement of an organization is not a matter of selecting one path or another, but of balancing; efficient production, effective product design, and humane management practices. These three areas have unique characteristics, which on their own would make great contributions to an organization. However, when working together, these

three areas create a whole new level of performance.

A systemic improvement system, does not exist in isolation, it is not a closed system. It exists within a larger environment, a containing system. With the skills learned while blending improvement efforts from production, product design and management practices, a systemic improvement system is better prepared to interface with the 'containing system.'

One way to balance production, product design, and management practice improvement methodologies is to support all three simultaneously, starting with pilot projects, then growing and expanding. Pilot projects may not be related, however keep the projects in close communication with each other. As the learning cycle revolves and grows, the efforts will feed upon themselves. As communication increases between each area, interdependencies become visible and are strengthened.

Don't be afraid of making mistakes. They will happen. And don't be afraid of having to rework a previous improvement effort when new knowledge becomes available, or when one effort is influenced by another effort, for that happens too. Example: when a process is redesigned because of a product change, or when a product is redesigned because of a process improvement. Keep the aim of the organization in view and then realize every improvement is another step in that direction.

Many people are concerned about how improvement projects are funded. The first few pilot projects may require some new funding, however the amount is normally small and the risks low. As projects evolve and grow, some of the money saved from the first process improvement projects can be used to pay for improvement efforts in areas where results take a while to show up.

In one state government, the Governor set up an agreement with various state agencies, where half of the money each agency saved through improvement projects remained in the control of the local agency. However, after three years, the annual savings were absorbed into the agencies baseline budget. The caveat was that the money could only be spent on new improvement projects or for the local school systems. This agreement gave people a voice in how they would change their work environment and how the gains would be shared. Improving the local schools also gave the people something tangible to work towards that had special meaning to them.

Imagine what a similar agreement would look like in your organization.

Changing is hard work, with many frustrations and setbacks. However, the rewards are even greater.

It's a brave new world! Let us work together, communicate, collaborate, and most importantly- have fun!

1. Deming, W. Edwards, The New Economics for Industry, Government, Education, 2nd ed., Massachusetts Institute of Technology, 1994, pp. 58-fig. 6

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