



**WHITE PAPER**

# **Is Cost & Value Engineering the Answer?**

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## Leading organizations are embracing Value Engineering to improve overall product functionality, optimize cost, increase operational efficiency, and mitigate risk within the supply chain.

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***“The best design is the simplest one that works”***

– Albert Einstein

The automobile was invented by Carl Benz who applied for the first automotive patent in January of 1886. In July of that year, Benz revealed his invention to the public in the form of the three wheeled Benz Patent Motor Car. By the early 1900s American had taken control of the automotive industry thanks to Ford Motor Company, founded by Henry Ford, and General Motors, founded by William Durant. The manufacturing processes developed in America along with access to cheap raw materials quickly led to American dominance in the automotive industry. By 1913, the United States produced 485,000 of the 606,124 automobiles manufactured globally.

Manufacturing techniques pioneered by Ford led to the wild success of the Model T and continued success of the American auto industry. The industry suffered with the rest of the nation through the great depression but survived to thrive during the World War II production boom and post war economic expansion. But a shadow fell across the industry in the 1960s. With the cost of American vehicles rising and the average vehicle being delivered to customers with an average of 24 defects, the industry was ripe for change. That change arrived in the form of small, lower cost, and higher quality Japanese automobiles. After setting record vehicle sales of nearly 13 million vehicles in 1978, sales of American vehicles fell to just

under 7 million vehicles in 1982. In 1980, Japan became the world's leading auto producer and by 1982 Japanese companies had captured 28% of the US market.

Things looked grim for the US automakers, but we know the story didn't end there. The US automotive industry underwent significant transformation in the 1980s and is still a major global force in the industry today. In addition to restructuring, workforce and production process changes, and major design shifts the industry embraced tools to help control costs and increase quality at the part and vehicle level. One of the tools US automakers embraced was a process developed by a General Electric Co. engineer to support World War II production called Value Analysis Value Engineering (VAVE). The process is still heavily used in the automotive industry and has evolved to be known as Cost and Value Engineering (CVE).

In the current economy, mid-size manufacturing and production companies face similar challenges to those faced by the automotive industry in the 1970s and 80s. Inflationary pressures over the past few years have increased Cost of Goods, wage rates are climbing rapidly, there are shortages of skilled labor, and many companies face ruthless global competition for key raw materials or production capacity. There is not a single “magic bullet” that will address all these issues, but CVE can be a key part of the solution.

## What is Cost and Value Engineering

Cost and Value Engineering is a systematic and organized approach to optimizing costs and functions of a product, project, or system. The method focuses on reducing costs while ensuring that quality and performance parameters are not compromised. It involves critical analysis of all elements of design and manufacturing to identify and eliminate waste, hence improving the value for both the producer and the customer.

Incorporating CVE into an operation presents a comprehensive solution to several pressing challenges faced by many businesses today - including increased costs, the need for product improvement, material shortages, sustainability concerns, team dynamics, and supply chain relationships. With its ability to handle complex, high-cost assemblies and optimize product designs, CVE can yield substantial returns. For most companies there is plenty of “meat on the bone” to address through the CVE process. Moreover, the benefits of CVE extend beyond just financial savings. The process also improves operational and revenue continuity by improving material supply flexibility and fortifying corporate supply chains. Additionally, CVE can contribute significantly to sustainability goals by reducing waste.

## CVE in Practice

When applied effectively, CVE can greatly enhance a company's operational efficiency and bottom line. Implementing CVE involves a systematic review of all aspects of the product and/or service design, the production process, and the supply chain, identifying areas of waste and opportunities for cost reduction. This could involve selecting more optimal materials or even re-engineering the product design to reduce



material requirements, improve functionality, and drive efficiency. Effective CVE requires cross functional collaboration and alignment.

Key benefits of CVE programs include:

- **Cost Reduction:** By eliminating waste and optimizing material specifications, companies can significantly reduce their production costs.
- **Improved Functionality:** CVE can enhance the functionality of a part or product, improving its performance and potential market appeal.
- **Increased Supply Market Flexibility:** CVE can help expand flexibility in the supply market, helping companies adapt to changes in supply and demand.
- **Optimized Make/Buy Decisions:** CVE can assist companies in making more informed decisions about whether to make a product in-house or buy it from a sub-contractor.
- **Sustainability:** By reducing waste, CVE contributes to a company's sustainability goals, helping it to reduce its environmental impact.

## Origins of CVE

The methodology of Value Analysis/Value Engineering (VA/VE) was originally pioneered for the manufacturing industry by General Electric Co. engineer Laurence Miles during World War II. In response to chronic, national shortages, Miles introduced VA/VE as a tactical approach to source alternative materials to produce essential goods.

In this process, Miles discovered that his system for re-engineering products not only preserved functionality but often enhanced performance while reducing costs. Following the war, Miles continued to refine this approach, which he named 'Value Analysis' (VA), shaping it into a strategic tool for manufacturers to gain a competitive edge.

Over time, this methodology came to be known as VA/VE and is now commonly referred to by practitioners as Cost and Value Engineering (CVE). Today, it is employed in many sectors, with the automotive industry being a notable adopter.

## How CVE Works

*"Perfection is achieved, not when there is nothing to add, but when there is nothing left to take away"*

– Antoine de Saint-Exupéry

This quote aptly captures the essence of the CVE process. The process unfolds in six critical steps, each of which contributes to achieving a perfect balance of cost-efficiency, functionality, and sustainability.

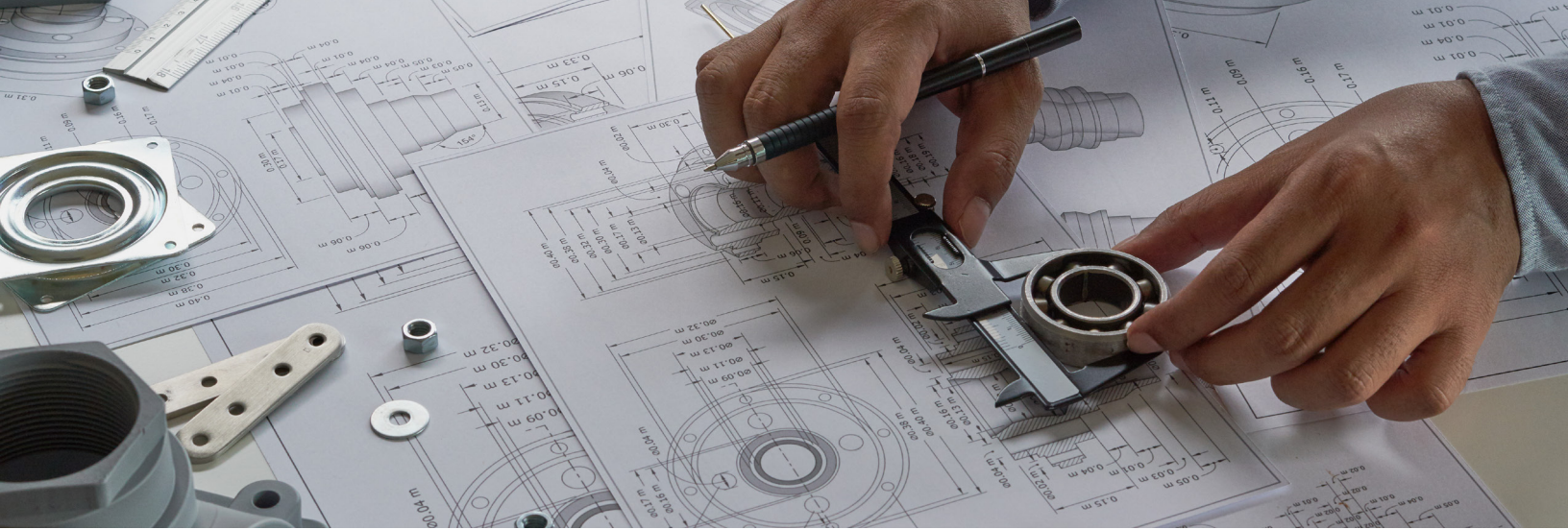
CVE Process:

- 1. Select Product(s) and/or Service(s):** The first step is to select a product and/or service with a large enough cost-of-sales value that can generate a substantial return on investment. This step is crucial as it sets the stage for the rest of the process.
- 2. Assemble Cross-Functional Collaboration Team:** Gather a cross-functional team of internal

and external stakeholders to participate in the CVE process. It is important that the team represents all the stakeholder groups including engineering, operations/manufacturing, finance, procurement and supply chain management, logistics, strategic suppliers, and quality control.

- 3. Understand the Process:** Visualize and map the process flow; consult operators/owners to identify common pain points and opportunities for improving efficiency. This step serves to uncover the areas where value can be added, or waste eliminated.
- 4. Idea Generation:** Conduct focused workshops to generate ideas while fostering open communication and collaboration among all stakeholders. It is important to utilize "possibility thinking" to encourage unencumbered innovation. At this stage, there are no bad ideas.
- 5. Score, Quantify, and Prioritize Ideas:** The ideas generated are scored, quantified, and prioritized based on several factors, including total cost savings, capital expenditure (and respective payback period), customer or consumer impact, functional additions or subtractions, and the time-to-implement. This step ensures that the highest value and most viable ideas are pursued.
- 6. Implementation and Monitoring:** After decision makers have approved the project, CVE shifts from a theoretical practice to a change management implementation process. To implement proposed changes, stakeholder teams are formed and assigned based on their expertise. Value engineer team leads often remain engaged with the changes to monitor the modifications and align expectations with the change management approach. Once changes have been made, monitoring begins to document benefits and identify any slippage or backsliding.





## Strengthening Relationships

The pandemic revealed minor cracks and, in some instances, significant fault lines in key relationships necessary for businesses to operate and compete. Internally, the relationship between procurement, engineering, operations, and sales experienced increased stress due to supply chain disruptions that interrupted operational continuity and delayed customer orders. Supply chain relationships were strained by both the pandemic and over two decades of aggressive supplier sourcing. CVE unites procurement, engineering, operations, sales, and suppliers into a single team with a common objective. The most effective outcomes are achieved when the focus is on cooperation rather than competition.

## Obstacles and Challenges

Despite the clear benefits of CVE, it's not without its challenges. Many mid-size companies lack the necessary skillsets, process knowledge, or bandwidth necessary to pursue a CVE program. Many employees who once held the knowledge and skillset to implement a CVE program have either retired or been downsized. Today, finding such expertise outside of certain industries, such as automotive, can prove to be exceptionally challenging. This skill shortage emphasizes the need for organizations to invest in training and development programs, cultivate in-house expertise, or partner with external professionals to navigate the intricacies of CVE effectively.

## A Wealth of Opportunities

In the immortal words of Lee Iacocca, "We are continually faced by great opportunities brilliantly disguised as insoluble problems." Today's manufacturing challenges, such as material cost inflation, supply chain disruption, and market competitiveness, are a testament to this assertion.

Material cost inflation significantly impacts the procurement process, creating a constant need to revisit and revise budgets. Fortunately, CVE provides the opportunity to reduce material utilization and identify cost-effective alternatives without compromising on quality or functionality.

Supply chain disruption, another major challenge, can halt production lines and delay deliveries resulting in customer dissatisfaction. Here, CVE plays a pivotal role in identifying opportunities to enhance flexibility within the supply chain, enhancing its resilience, and ensuring business continuity.

Lastly, in the face of fierce market competitiveness, businesses must constantly innovate and improve. CVE fosters this by creating an environment where continuous improvement is not just encouraged but is an integral part of the process.

Today's manufacturing challenges, while formidable, are not insurmountable. With a well-strategized CVE approach, these challenges can indeed become opportunities for sustained growth and profitability.

## Getting Started with CVE

At New Dominion, we are proficient in delivering turnkey CVE programs tailored to your business requirements. We believe in a systematic approach that starts with a thorough assessment. This initial step is crucial as it provides an in-depth understanding of the existing processes, identifies potential bottlenecks, and uncovers areas for cost savings and operational efficiency.

Drawing upon our extensive knowledge, skills, and experience, we are fully equipped to spearhead CVE initiatives from their conceptual stages through implementation. We aim to transform your challenges into opportunities, driving profitability, and ensuring sustained growth. Allow us to support your journey to operational excellence through strategic Value Engineering.

CONTACT JEREMY BARGER TO LEARN MORE ABOUT OUR FIRM, ARRANGE A DISCUSSION WITH OUR EXPERTS,  
OR EXPLORE YOUR SUPPLY CHAIN DIVERSITY OPPORTUNITIES.



**Jeremy Barger** has over 25 years of industry experience including progressive roles in procurement, supply chain, and operational functions up to and including COO and VP Global Supply Chain. His most recent advisory experience includes C-Level interim leadership focused on continuous improvement facilitation, operational restructuring, transition planning, M&A due diligence/integration, and procurement transformation.

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**Tim Murphy** is an experienced consultant with over 25 years of experience helping clients capture value across their supply chains. He has extensive experience in procurement operations, sourcing, spend analysis, and category management. Tim believes that business process innovation is critical to the advancement of procurement and supply chain to survive and thrive in evolving global markets.

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New Dominion Consulting strives to provide extraordinary value to clients through the development of innovative, tailored solutions to meet today's challenges. We specialize in supply chain, procurement, operations, and sustainability where we help our clients improve outcomes and optimize realized value.