This whitepaper provides an insight into how world class companies have achieved a competitive edge through Value Engineering. Also get to know the factors that have challenged most of them, from our perspective, after working with various customers on their value engineering requirements. Although there could be a lot more to Value Engineering than what we have documented here, this paper, however, should provide a good reference in understanding the methodologies and a holistic approach required to internalize Value Engineering into the organizational DNA and reap continuous benefits across all product lines.

Value Engineering is a process rather than a program. It is an ongoing use of a methodology by cross functional teams to achieve organizational objectives. Broadly it consists of four activities:

- Identify the function of a product or service
- Establish a worth for that function
- Generate alternatives through the use of creative thinking
- Provide the required functions to accomplish the original purpose of the project at the lowest life-cycle cost without sacrificing safety, necessary quality, and/or environmental attributes of the project

Value engineering (VE) concepts can be applied to business as well as technical situations and consequently lead management to informed, results-oriented decisions. “Value Engineering has to be treated as a future investment for gaining technology leadership in the industry. VE is a fantastic process that triggers a complete overhaul of the system, alternate design, alternate material, design verification for strength, durability & safety; manufacturing process & testing. From our experience, VE has many a times led to disruptive innovations and environment friendly systems & technologies.” says Suneel Pandita, AVP and Head - Mechanical Engineering Design, KPIT Technologies, commenting on benefits of value engineering.

Most often than not, VE initiatives are reactive to market pressures. Post product launch, VE is initiated as a reaction to field failures, market feedback and competitive pressures. e.g. after you have launched your...
product, a competitor brings in a product a lower cost or at same cost with better features, then it becomes almost essential to re-look at your product so as to stay competitive in the market. Projects that have already experienced cost, schedule, or scope problems benefit from VE analysis. But the greatest potential for improvement is in the R&D Phase at 20-35% completion. VE at this point produces maximum benefit because recommendations can be implemented without delaying progress or causing significant rework of completed designs. R&D is hard pressed on deadlines for product design. Mostly this results in oversized parts or products with a higher factor of safety than actually required. This gives an independent team a lot of room for value engineering since R&D may have a bias towards the designs they've developed.

Cost and weight reduction, quality improvement and feature enhancement are obvious and expected results of VE initiatives. While the average cost improvement from VE is 6%, cost reduction is not always the most significant benefit. There are many other outcomes which accompany VE activities. Many times, VE results in breakthrough technology, new designs and IPs for the organizations which give them a competitive edge. Innovations for alternate materials have also come out of VE initiatives. VE done for manufacturing process can help in process streamlining and optimization as well as variant reduction.

In spite of all the benefits that VE can bring to an organization, the rate of VE initiatives is not as rosy as it seems. Our experience with various automotive OEMs reveals that as many as 70 to 80% of VE programs die out when instant results do not occur because of budget constraints or lack of dedicated VE team. Out of the rest 60-70% fail to reach the implemented stage on a vehicle program because they do not meet expected gains. Internal teams face roadblocks selling VE initiatives to the top management. All the incoming ones do not go for value engineering and only those are selected which either promise long run savings or extend the active engineering life of the vehicle model. Management here plays a major role as they have to take a call for implementation of VE results based on Total cost of change analysis, so they need to be convinced of the overall gains.

Following factors emerge as a differentiator when we dive deeper and try to analyze organizations who have achieved a competitive edge through VE from those who are struggling with their VE Initiatives;

- Executive management commitment
- Dedicated VE cross-functional team(CFT) accountable to meet business objectives
- Program management of VE initiatives with clear milestones and targets
- Proactive VE and standard VE framework across all groups of the organization
- VE integrated with continuous improvement process, product development process and problem solving for process characteristics

KPIT has helped its customers strategize VE as a process. Teams from OEMs and Tier I suppliers have domain specialists; while an independent engineering provider like KPIT brings in framework and process specialists. Based on experience with the customers, KPIT has developed an approach for value engineering which comprises of a detailed methodology and a Penta-phase gated process. This is time proven with assured results for different customers across different product lines. The gated process here is a critical factor in getting desired results. Each phase has defined owners and a cross functional team ensures that inputs and considerations from all stakeholders are taken care of. The “gated process” ensures that there are no attributes that get neglected.
The process also gives VE a systematic approach for problem solving, a result driven program management and schedule adherence. This means that VE projects reach implementation stage and there is a buy-in from top management for the solution.

To realize sustained benefits from value engineering sustained and focus efforts, dedicated team and a fundamental strong process are very essential. Successful organizations look at VE as an instrument to grow business.

Value Engineering gives a breather time to the design group for developing new product lines and platforms. Leveraging value engineering for extending the Active Engineering Life (AEL) of a vehicle program is an art. World class OEMs have gained technology leadership through this.

“Realizing the full potential from value engineering needs a paradigm shift. VE has to be looked as an instrument for business growth. Organizations can reap continuous benefits across all product lines only when VE is internalized as a holistic approach into the organizational DNA”, says Suneel Pandita, commenting on the scope of value engineering.

Fig 5: VE for increasing Active Engineering Life (AEL) of a vehicle program