

EFFICIENCY OF RESOURCES IN THE AUTOMOTIVE SUPPLY INDUSTRY PRACTICAL APPLICATION IN THE VALUE ANALYSIS

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Project Description

W.E.T. Automotive Systems AG was founded in Munich in 1968. The company stands for technically fine-tuned products of the highest quality. W.E.T. are valued partners within both the German and international automotive industries. With new locations dealing in development, production, and customer service worldwide, close proximity to their customers helps to fulfill paramount goal of customer satisfaction.

For years the company has been recognized by their largest customers as a dependable and outstanding supplier. They have led the industry worldwide in heated seating, with over 50% market share. Development in the area of automotive cables has also been very positive. Climate controlled seating is becoming an increasingly important part of their business. After many years of research and experience in this area, W.E.T. remains a step ahead of the rest when it comes to know-how and technology.

Innovation is the steadfast goal. W.E.T.'s various patents speak for the technical leadership that defines the company. With new products and production methods continuously being developed, W.E.T. sets the standards for the future in the area of specialization. There was the necessity to not only

lower the manufacturing costs, but also to reduce the variety of parts at the component level in the area of wire-based seat heaters. For that reason, the Management decided to start a value analysis project in 2010.

Starting situation

- » The automotive manufacturers request yearly reductions in price (several percent). These are part of the delivery contracts.
- » There is a strong competition in the area of wire-based seat heaters which additionally beats down the profit margin.
- » Labor costs have already been reduced as far as possible by relocation abroad.
- » The material costs represent a big portion of the manufacturer costs.
- » The material costs rise due to the situation at the crude material markets. In most cases, subject increase cannot be forwarded on to the OEMs.



The task of the project

- » To determine the cost potentials in the area of wire-based seat heaters and to point out ways to raise such potentials on a short-term basis.
- » To determine the competition situation and the market requirements in order to define the design directions of the project work.
- » To determine the cost-pushing functions and component groups and to methodically derive the corresponding measures thereof, in order to lower the costs.
- » To find and argue the advantages and unique features of the WET products compared to the competition products as a basis for the market communication.
- » To elaborate the product details in accordance with the cost potentials in order to allow for a prompt realization of the project results to become marketable products.

The project included a special challenge, which was the distributed production, i.e. the production was solely located overseas. This meant increased communication expenditures, however, including higher personal friction for the teamwork.

An interdisciplinary team was established to ensure the holistic approach and to identify really all cost influences. There have been no restrictions at the beginning of the project, so that also a new design was as accepted as changes of production processes or also the purchasing of the components (make-or-buy-decisions). The project team was established with members from marketing, R&D, production, purchasing, controlling and the coaching company Krehl & Partner.

The project goals have been defined in a clear way: the important cost goal was defined as percentage saving of the production cost of the product family. The time plan showed the kick-off in June 2010 and the establishing of a concept proposal up to October 2010. Then, the realization of the ideas had to start.

The methodology of VA/VE and the single project steps have been provided and supported by the coaching of Krehl & Partner. The procedure was according the classical VA/VE approach and included besides the initial phase the following 3 main phases:

- » Develop solution ideas
- » Evaluate and fix solutions and
- » Documentation with final presentation.

Analysis

The first step in a value analysis is the analysis of the market: which markets shall be serviced for which customers and what are the customer requirements for subject customers?

The markets and customers were clearly defined for the WET.



Picture 1: Performance – Price – Portfolio for a specific market

They are the leading automotive manufacturers and/or their 1st Tier Suppliers in the main markets America, Europe and Asia.

Based on the buying decision criteria, the main competition products and the WET products were compared to each other in the different wire-based seat heaters technologies.

The exemplary result is the following performance - price portfolio which reflects the market situation in a certain market (picture 1). It is evident that there is a requirement to take action for WET as follows:

Method 1:

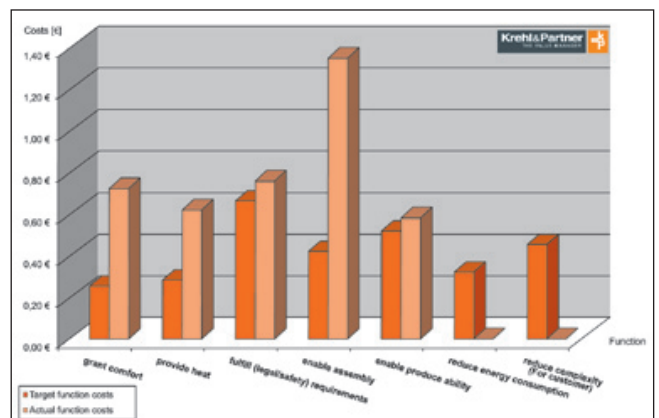
The own product ranges in the medium average, since some competition products are inferior, or more favorable in price. But especially the high-selling competitors are better. That is why there is the danger that the WET product is no longer competitive. Here, we need to take action to ensure an improvement of the product.

Method 2:

In this instance, the own product is state-of-the art, however, more expensive than the product of the competitor. Here, we need to take action to lower the costs.

Method 3:

This is a new development which, at the present time, still inherits a unique selling point.



Picture 2: Example for a functional cost diagram

Thereby, the project goals were verified and, what was also extremely important, were understood and accepted by all team members.

The function analysis is regarded as a core element of the value analysis. The main task of the function analysis is to generate a mutual understanding for the product by all team members and to figure out the essentials of the products.

If you also elaborate the costs caused by subject functions and compare them with the costs desired by the customers, one gets a very good picture of the product and, at the same time, also a first part of the project planning (picture 2).

The most essential functions of a wire-based seat heater are the following:

- >> Grant comfort
- >> Provide heat
- >> Fulfill(safety / legal) requirements
- >> Enable assembly
- >> Ensure producibility

The function cost analysis has revealed that most of the costs will have to be spent for the functions „Fulfill (safety / legal) requirements“ and „Grant comfort“

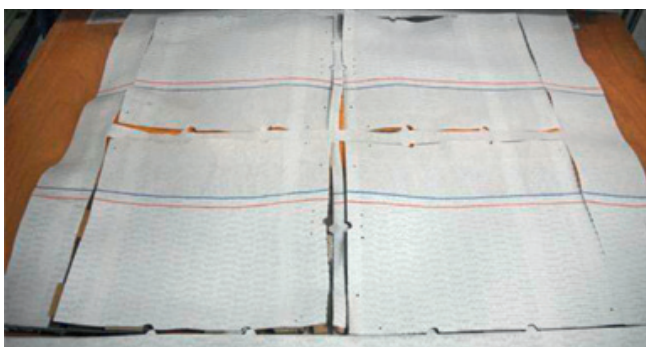
From the customer's point of view, the function „Grant comfort“ is not that important. With reference to the specified five functions, subject function is the least important. Besides this awareness, including further knowledge from the function analysis, the further proceedings in the project became clear: to significantly reduce the costs in the function „Grant comfort“.

Concept phase

Out of the long list of ideas with possible improvements and changes that have been established with the help of VA/VE and functional analysis, the team filtered the ones with the biggest chance of realization and with a reasonable return on investment.

Generally, problem-solving approaches resulted from the following areas:

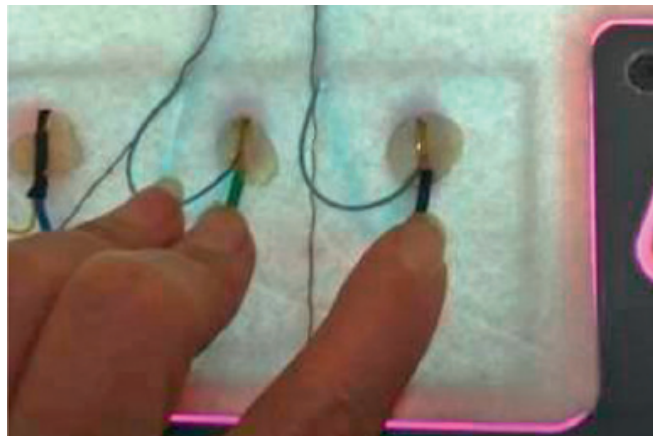
- >> Reduction in Material costs by reducing the chads.
- >> Less complexity by raw material variant reduction
- >> Optimization of logistics costs
- >> Definition of more favorable standard design solutions



Picture 3: Example for Wasting Material during the Punching Process

Example 1: Reduction of Punching Tolerances Saves Material

One manufacturing step in the production of wire-based seat heaters is the punching of a preliminary contour, as well as punching of the completed contour. Both contours are tolerance-based, and an incorrect punching will automatically result in off-cuts. Off-cuts will lead to high costs, specifically during punching the completed contour, since already some value gains have occurred by material and wages. Therefore, it is desired to select the punching tolerances pretty narrow. On the other hand, it is not intended to unnecessarily increase the material consumption of valuable raw material. For that reason, one important project result is the optimization of punching tolerances (picture 3).



Picture 4: Example for hot melt dots on the carrier material

Example 2: Omission of Gluing Dots

A further manufacturing step lies in the final assembly of the seat heaters: The harness must be fastened to the carrier material. This is done by hot melt adhesive dots which also fasten the cables and simultaneously protect the contact surfaces from corrosion. The detailed examination of a significant number of gluing dots could be eliminated, since they were only attached for internal preliminary fastening. Subject function was fulfilled in a different way by a modification of the manufacturing process (picture 4).

Realization

The concept phase was completed in October 2010, as planned. The most essential knowledge was the following:

- >> There are positive effects on new developments by applying new standard design solutions and raw materials.
- >> Sometimes it is difficult to make changes with series products, since everything must be sampled at the customers'. Under certain conditions, extremely high revalidation costs will result thereof.
- >> Positive results from the reduction of chads.
- >> Many ideas can be realized on a short-time basis. Based on the change expenditures, other ideas can only be introduced with new generations of vehicles. That means that the realization will take up to 5 years. Spare parts have to be supplied at least 16 years after the end of their production.

All positive results will only then be successful when they will be realized and/or integrated in the series. To ensure this, the team structure was maintained and a realization project prepared. 12 work packages were defined from all relevant ideas and measures which were followed systematically and worked-off. Also here, the interdisciplinary and international team was available. Especially in the realization phase it was extremely important that all manufacturing sites were participating and were really willing to realize the ideas. This way, the team meetings which were accompanied by WEB conferences, took place in the company's head offices in Germany, and were supported by site visits at the individual locations.

Especially subject site visits contributed decisively to a uniform understanding, by which the realization of the measures was promoted. As a consequence, the following knowledge was found in addition to the optimization of the product pallet:

Telephone conferences will never replace personal meetings!

- »» Visiting the manufacturing sites
- »» Effective understanding of the ideas
- »» Understanding the global coherence
- »» Exchange of know-how among the individual manufacturing sites
- »» Improved getting to know each other, by which the following communication will be much better
- »» Making mutual decisions, not getting orders from the supervisors.



Picture 5: Visit of the team members in Mexico