



Creating a modular product architecture

Challenge

An important part of the product program is a range of automatic accessories based on different functional principles, and powered either by electricity from the grid or by solar power. These accessories are offered in a broad range of colors and sizes that fit all of the case company's products sold today in different markets, as well as an extensive legacy portfolio of products no longer on market. The company aims to produce the accessory program in close proximity to customers on a day-to-day basis.

In combination with fluctuating market demands, this complicates the production task significantly. A major part of the accessory program is going to be updated in near future. This will entail a new visual identity of the products that has to be applied to the portfolio of automated accessories. Instead of only updating the visual identity, the company wants to improve quality and functionality, by uniting the different types of automated accessories into one modular product architecture. Additionally, a central objective for the new architecture is to reduce the complexity of the production task and the supply chain.

Approach

In order to identify the right level of modularization, CPC has been working closely together with the development team in creating a total overview of how market needs can be met by different functional principles, and how these principles can be realized within production and supply. Based on the insights gained from creating these overviews, various modularization alternatives has been considered and evaluated on their ability to deliver comprehensive flexibility to meet customer needs, and their ability to standardize complicated functionalities where variance do not add value to the customer. The derived needs for component variance and the impact on production and supply processes have also been evaluated, as well as the economic consequences of the suggested modularization alternatives for the new architecture.

Results

The activities led by CPC has worked as a basis for decisions, from which the company has developed a modular product architecture that is balanced for rapid delivery of excellent functionality, larger product variety and improved quality of the products. At the same time the production task has been simplified by minimizing the product complexity and required component variance while achieving a large number of scale benefits.

By implementing the developed modular product architecture, the company will be able to extend the product offerings by 33% while reducing the number of components by 33%, compared to the existing product program. Furthermore, the new product architecture has been prepared for a range of future updates on a modular level, which will introduce new functionality to the customers with a very limited development effort.

Modularization of the product architecture has enabled simplification and modularization of the production processes as well. This has enabled standardized pre-production of complex generic modules in low cost production sites, while the final assemblies have been simplified and the processes kept in close physical proximity to the markets and customers. In the end, this has led to a 50% reduction in final assembly time, and a reduction of working capital by a complete elimination of today's need for keeping costly finished goods in stock.

The case company

The case company is an international manufacturer of premium products used in the residential and commercial construction industry. The company is market leading within its segment offering their products supplemented by an extensive range of accessories to markets worldwide.