

Revolution of parametric design

How is product design process transformed from designing mass-produced products to creating unique pieces?

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This research aims to understand the theory of parametric design, deepen the acquired knowledge and apply it to a practical design task. The paper gives an overview of the theoretical background of parametricity and explains the possibilities of the related new mentality. As part of sustainable development, planning process based on algorithms could revolutionize the product design and make market introduction of new ideas more effective.

I will describe the underlying foundations of mathematics running in the background of computational methods, as well the philosophy and operation of the programs used. The focus is placed to the integration of parametric design into product design, among the possibilities of its application. In the modern approach creative activity is implemented in a new mental plane, engineering design activity is transformed into defining activity with the help of softwares, meeting of the desired function in the course of problem solving happens through setting up a system of rules. This ensures the option to create a number of concepts in a short time, and simplifies, accelerates the testing and development process.

Growing market demands and accelerated development requires the deployment of new design techniques. Methods, in practice still less used will be necessary for a high level satisfaction of customer needs. The extension of the customer-oriented philosophy has many advantages for companies. It enables an opportunity to design unique products that entail customer satisfaction and increased circle of trust. The design, production, storage and transport processes are getting shorter in time, however, companies can also reduce expenditures. Direct involvement of users in design processes in order to create personalized products may develop into a trend. To building of new guidelines the available knowledge and information technology background provides a solid basis.

The results of a questionnaire prepared for the assessment of customer needs shows us, that approach in question should be introduced into practice. A question related to the vision of future will be expounded: as a consequence of the changes in consumer society, will the value of designer's work be reduced, if „average people” can design independent products by themselves? The widely applicable additive manufacturing techniques, the rapid prototyping methods are listed at the end of the outlined product implementation process. Due to their rapid propagation and development, they can be used for make final products.

As casework own designed individual lamps will be introduced. Through them I will describe the parametric design's essential element, the method of building algorithms and the possibilities lying in them. A parametric designing software, Grasshopper will be described, which is working as module of Rhinoceros3D and is applied to create the models. A prototype one of the products that is created by the described modern designing procedure got ready, so that the lamp's example characterizes the process all the way from the designing through the manufacturing till the assembling phase. However, the result of the research is not the designed product, but the elaboration and application of the new designing approach, methodology and the expansion of the application's opportunities.

