

# **Tooth-implant life cycle design**

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## **Abstract**

The presentation describes selected aspects of tooth-implant life cycle design. The authors explain what they mean by implant life cycle design as one part of the whole Digital Product Development (DPD) process. The sequential stages of this process are described and the used tools and methods are discussed. The attention is focused on method of computer aided design, especially numerical simulation of dental implants mechanical behaviour, using CAD, CAE and CAM software in design procedures, genetic based optimization algorithms and design exploration and optimization technology.

The role of the various stages and partners in enabling a '3D virtual experience' to drive the product development (tooth implant) will be discussed. The process always starts with the consumer experiencing an existing products and can be used to capture requirements for a new or updated (improved) products. The new product is designed using CAD systems, analysis and optimization tools and CAM systems. In the cases of bioengineering products these have to be enriched by clinical testing. Realistic simulations are used to understand the behavior of the product and whether it is compliant with the design requirements. The designer can then also experiences the new product virtually just like almost real life and gives feedback before the product has been physically manufactured.