



The Next Generation of Engineering Analysis Software: Simulation Process Modelling

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1. Introduction

2. The Difference between Simulation Software and Simulation Process Modelling

3. The Business Benefits of Simulation Process Modelling



- Use of FEA nowadays standard in product development in all industries
- Development and application of (analysis) software typically features and functions driven
 - More or less neglects strategic aspects that deal with
 - methodology development
 - integration of simulation tasks into development processes
- Gap between software training and efficient software usage
- Users should be focusing on supporting the product development cycle to increase engineering efficiency

- *“Next generation software” is in fact the optimization of principal usage and interaction of diverse software tools to best support the requirements of the product development cycle*

■ The Difference between Simulation Software ■ and Simulation Process Modelling



- “Next generation software” is not meant as a replacement of existing “traditional” engineering analysis software
 - complimentary to existing CAE software packages
 - logical extension to diverse analysis tools

The Difference between Simulation Software and Simulation Process Modelling

Feature based “rich” or “high-fidelity”
single physics software development

Basic research on coupled physics

Industrial applications for single
discipline / physics

First multiphysics applications

System level simulation (with
multidisciplinary approach)

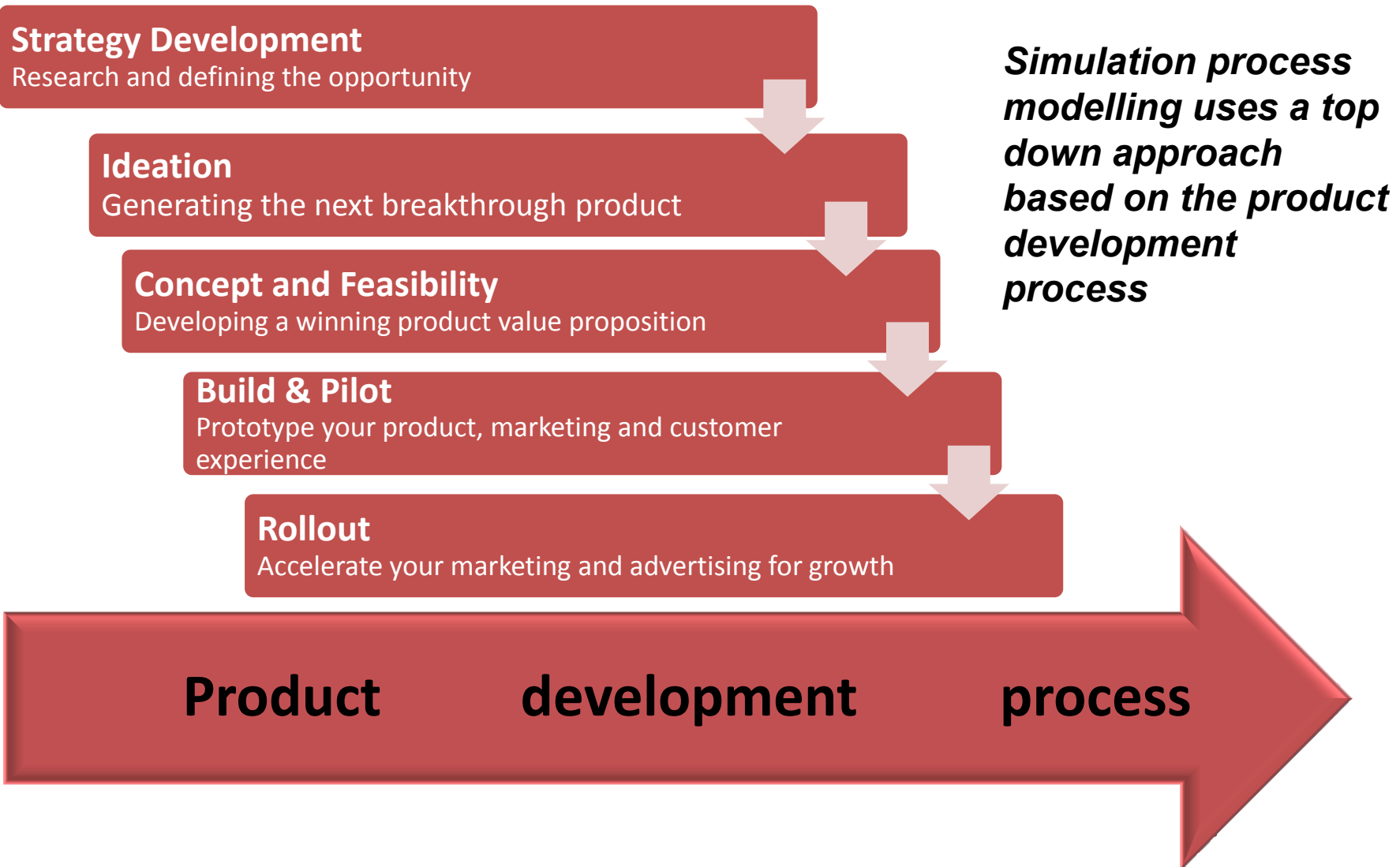
*Evolutionary steps
of 25 years of finite
element methods*

Simulation

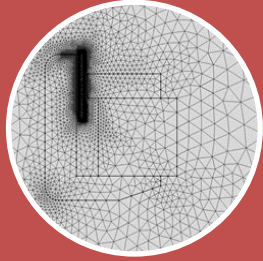
driven

engineering

The Difference between Simulation Software and Simulation Process Modelling

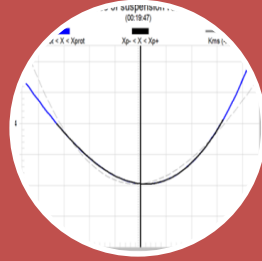


The Difference between Simulation Software and Simulation Process Modelling



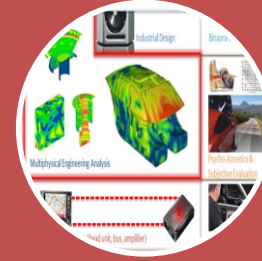
Dimension "Detail"

From lumped parameter (sub-)models to 3D fully detailed FEA models



Dimension "Linearity"

From linear to fully nonlinear models



Dimension "Scale"

From component to system level

Simulation process modelling will deliver methodologies and process flows that use simulation software to optimally support each major phase of the development process

Product

development

phase

- Observation of similar benefits as with first time introduction of CAE methods
 - virtual systems can be used as test beds for innovations
 - more freedom in design decisions
 - design changes can be evaluated without building prototypes

- Business benefits apply to whole products as a system
 - Amplification of the following benefits
 - speed up development process
 - reduce development costs
 - minimize prototype expenses
 - improve product quality

■ The Business Benefits of Simulation Process Modelling

- 1st practical implementation of simulation process model (M-voiD®)
 - Multi-disciplinary virtually optimized industrial Design
- Virtual development of automotive audio systems
 - virtualization of whole development process by means of advanced CAE methods

