Summary 2

Tom Lange talked much on the examples of where high-performance computing and modeling and simulation are used to solve some specific problems faced by P&G during product creations.

First, he talked about DPD simulated effect of surfactant on detergency. The effect is hard to be observed in real world, but using simulation running on super computer, it is much easier to see and understand. He also talked about the simulation of Soft Nano behavior. In real world, worm-like micelles are too small to see with any microscopes, but by simulations of millions of molecules, it is easier to predict and understand the body wash formulations. And he mentioned modeling stratum corneum is important to understand the physical properties of skin, so engineers can make implications for both personal care products and pharmaceuticals. Engineers can easily see the structure and do some experiments in the simulation to better understand the nature.

He mentioned that CAE is also applied in disciplines like: solid mechanics, fluids & thermal, chemical systems, dynamics & controls, empirical & optimizations and high-performance technical computing. Examples are model for fluids in making absorbent diapers, model of mixing non-Newtonian fluids like toothpaste without making a real-world container, and model of filling unit dose products to measure the least time it would take to fill one-unit dose to increase the efficiency.

Packaging is a big field he mentioned in this talk. Models of package prototypes are made to do wall thickness prediction and to see top load stresses and injection stretch blow molding without making a real bottle to do some experiments with it. Also, simulations are used to ensure that it is easy to convey because for factories, it needs to be done before mass production. Also, physics-based models are used in advertising to make customers to have a better understanding about how this shaver works. Simulation of a whole shaver to check the strength of every part in this shaver before it is ever made to save budget as well as time. The last example he mentioned was model for opening jars to make a better balance between no leak and easy to open without hiring 10 thousand people to just opening a jar for experiment.