CONSUMER PRODUCT R&D

COMPANY ANALYZES PRODUCT IMPACT ON BIOLOGICAL SYSTEMS

The Procter & Gamble Company (P&G) is an Ohio-based multinational consumer goods company with manufacturing operations in approximately 70 countries and is a founding partner of the AweSim initiative.

P&G markets a wide range of products, including cleaning agents and personal care products. With more than $80 billion in annual sales, P&G credits much of its success to its proven track record of innovation leadership.

As part of its basic research initiative, P&G scientists and engineers have pursued the identification and sequencing of genes, enzyme expression, molecular modeling simulation and use of X-ray crystallography to identify enzyme structure.

New sequencing technology has allowed the interrogation of various aspects of biological systems of interest, ranging from sequencing microbial genomes and analyzing microbial communities to generating transcriptome profiles. These trials produce data on the order of hundreds of megabytes to terabytes in size.

"All the reasons that advanced modeling and simulation are used in the fields of aircraft, military, defense, electronics, automotive—all high-tech industries—are the same reasons we use it in our company ... to virtually test products and systems."

— *Tom Lange, retired director of modeling and simulation at P&G*

VIRTUAL DESIGNS. REAL BENEFITS.

FOOD PROCESSING & AGRIBUSINESS

FOOD PROCESSING
& AGRIBUSINESS

P&G

2014

THE CHALLENGE

P&G recognized years ago the powerful tool modeling and simulation could be, providing tremendous benefits in many business areas such as development, manufacturing, time to market and better product performance. However, shifting from traditional large-scale physical testing wasn't just a challenge technically but culturally. Getting "buy-in" from inside and outside an organization can often cause challenges and delays in getting a modeling and simulation program running.

THE APPROACH

In collaboration with OSC, the P&G bioinformatics team has been able to process a high volume of sequencing data with the ability to customize software and to transfer data in and out of the cluster. Working together, P&G and OSC have effectively overcome the computational challenges to process and gain insight from big biological data.

THE SOLUTION

P&G partnered with OSC and others in 2013 to form AweSim, a $6.4 million public/private initiative designed to promote the benefits of modeling and simulation to small and mid-sized manufacturers. The initiative was funded by the Ohio Third Frontier economic development initiative and program partners P&G, Intel, AltaSim Technologies, TotalSim USA, Kinetic Vision, Nimbis Services and OSC.

Now, P&G uses "this rocket-science supercomputing for everyday products: to see whether formulations separate, that diapers fit on babies, how shampoos dispense, whether a razor breaks when you drop it, how tanks of toothpaste mix, how machines run and how they're scheduled," according to Lange.