

Drip-free design meets need for speed



Hartree Centre
Science & Technology Facilities Council



Using supercomputer Blue Wonder, the Hartree Centre has helped Unilever slash many months and tens of thousands of pounds from the design process, whilst delivering the best consumer experience for new laundry liquid products.

Challenge

For consumer goods multinational Unilever, consumer satisfaction is non-negotiable. The business's ability to outpace competitors and grow ahead of its markets depends on continually finding new ways to meet consumer expectations and accelerate the innovation to market process. In the laundry liquids segment, the time taken to produce and test physical prototypes is lengthy and expensive, typically lasting three to five months. In 2015 Unilever set out to design a more effective non-drip, no-mess laundry pack and, in order to dramatically reduce the time and cost relating to this innovation, sought to minimise the need for physical prototyping through the exploitation of increased simulation capability.

Solution

The answer was to create a revolutionary 'virtual pouring test' simulating how design modifications to packaging features such as the spout would affect pouring performance. Once fluid dynamics simulation specialists CD-adapco had produced an easy to use tool based on its STAR-CCM+® software, Unilever harnessed the Hartree Centre's Blue Wonder iDataPlex cluster to optimise runtimes. This enabled the tool to generate results in hours rather than the days that would have been needed to complete each analysis using conventional computing infrastructure.

Benefits

The virtual pouring test has the potential to benefit a significant proportion of Unilever's global laundry liquid portfolio. To date, it has been applied to three laundry pack designs and the huge benefits are already apparent. On one project alone, optimising packaging through five design iterations took just 2 weeks compared to 20 weeks for a traditional prototype-based process. This not only ensured On Time, In Full (OTIF) delivery to market but also eliminated investment in prototype tooling costs. Importantly, the virtual pouring test can produce quick, accurate simulations for non-Newtonian fluids (whose viscosity varies when force is applied) as well as for Newtonian fluids (whose viscosity is constant) – a vital consideration when working with formulations for the Home Care market.

"For Unilever, digital design is a key tool to help realise the company's innovation ambition – our collaboration with the Hartree Centre has been instrumental in helping us to deliver our products to the market as fast as possible."

– Dr Brian Jones, Simulations Engineer, Unilever

Work with us

We collaborate with industrial clients and research partners on projects that create insights and value using high performance computing, big data analytics, simulation and modelling.

By combining our world-class facilities with access to our specialists and computational scientists, we can enable your organisation to produce better outcomes, products and services more quickly and cost-effectively than through conventional R&D workflows.

With our partners we are developing the next generation of supercomputing architectures and software, combining existing best practice with innovation to deliver faster, cooler and more sustainable solutions capable of meeting the challenges of data intensive computing.

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