

Improving packing line efficiency

Researchers based at the STFC Hartree Centre are working with Unilever to optimise their packing line operations using the power of data.

Challenge


Automated packing lines for Fast-Moving Consumer Goods (FMCG) – including toiletries, packaged food, and over-the-counter pharmaceuticals – process hundreds of product units per minute and run close to 24 hours a day, 7 days a week. Packing line inefficiencies occur due to unplanned stoppages, for example due to mechanical or electrical faults, or minor problems which need to be rectified by an operator. The high throughput of the lines means that relatively small changes in stoppage rates can equate to a difference of millions of units processed per year. Unilever wanted to understand and optimise their packing line operations by making use of the large volumes of data automatically collected from the lines.

Approach

The research team used big data workflows on the Hartree Centre's high performance computing systems to align millions of packing line machine error messages with line rate data at a resolution of one second or more, providing a full picture of the operation of each line. The team then used data science techniques to derive insights as to where, and to what extent, efficiency improvements could be made – for example, analysing the overall impact of certain types of machine errors or product changeovers on line productivity.

“This very thorough analysis with clear visualisations of these complex data sets has revealed new insights that have helped us prioritise the key areas for focus in order to improve the efficiency of our manufacturing process.”

Adam Kolawski
Unilever



Credit: Unsplash

Benefits

Completed as part of the Innovation Return on Research (IROR) programme, a collaboration between STFC and IBM Research, the analytics from the project showed in detail the opportunities for improvement to Unilever's packing lines, enabling them to target line performance improvements much more efficiently. The tools developed during the project can now be applied to derive analytics from any manufacturing data in FMCG and other sectors, accelerating data-informed decision-making to improve production operations.

At a glance

- Used big data workflows to help provide a full picture of the operations associated with each packing line
- Delivered insights on opportunities for improving the efficiency of Unilever's packing lines
- Accelerated data-informed decision-making to improve production operations
- Enhanced the company's understanding of digital technologies
- Valued working with the STFC Hartree Centre as a trusted partner

Who we are

The Hartree Centre was created by UK Government to help businesses and public sector organisations accelerate the adoption of high performance computing (HPC), big data analytics, artificial intelligence (AI) and quantum technologies. We play a key role in realising UK Government's Industrial Strategy by stimulating applied digital research and innovation, creating value for the organisations we work with and generating economic and societal impact for the UK. We are proud to be part of UK Research and Innovation.

What we do

- Boost productivity and innovation for industry
- Offer training and skills development
- Provide insights into future technologies
- Give tailored business development support
- Build bespoke small teams around your project

