

RETAIL LAB

Technology from Cern has already changed the face of retail and now one of its alumni hopes to usher in the next revolution.

By **Matthew Chapman**

A quantum leap



In 1989 Sir Tim Berners-Lee invented the World Wide Web while at Cern, the world's largest particle physics laboratory. Twenty-five years on and Blue Yonder founder Professor Doctor Michael Feindt believes he has struck upon the next innovation that will send shockwaves through the retail industry.

Feindt is a particle physicist who worked at Cern for six years up until 1997 on projects including the Large Electron Positron Collider, the predecessor to the Large Hadron Collider.

His company already works with German grocer Kaufland and Eat in the UK, and has signed up other British retail clients, which Feindt says he cannot reveal at present.

Retail Week was invited for a tour of the Large Hadron Collider to investigate the science that could revolutionise retail.

Big data

The term 'big data' has been used so often it is in danger of becoming meaningless, but Cern scientists had big data long before the term was coined and understand it better than anyone.

The Large Hadron Collider, which made headlines with the discovery of the

Higgs boson particle, used to be the largest data source in the world before being overtaken by telephone traffic, and created more data on its own than was generated by the combined population of the world.

Feindt has been instrumental in developing the complex algorithms that have helped Cern scientists cut through the huge quantities of data collected by the Large Hadron Collider.

He is taking his discoveries from Cern to help retailers capitalise on the information at their fingertips.

"Data is collected quite a bit by businesses but only a tiny fraction is exploited so I think retailers can do way more," says Feindt.

He believes the same scientific principles can be used by retailers to make sense of their big data in order to introduce dynamic pricing and automate the restocking of stores by predicting future demand.

Inside the Large Hadron Collider, which measures 27km in circumference, there are some 40 million collisions between particles per second. Of these, only one in every 10 million are recorded because most particles created by such collisions are known to science and thus classed as "uninteresting".

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The particles collide while travelling at 99.9999991% the speed of light and each one is in effect a mini Big Bang.

Algorithms have been developed to filter out the uninteresting collisions and Feindt believes they are near infallible.

"We have to be very, very sure that only interesting things are recorded," he says.

"It takes all our expertise to build new algorithms to make decisions, we would hate if something interesting happened and we did not see it."

Predicting demand

For retailers swamped with data, the ability to take the data skills of Cern and apply them to their businesses is a mouth-watering prospect.

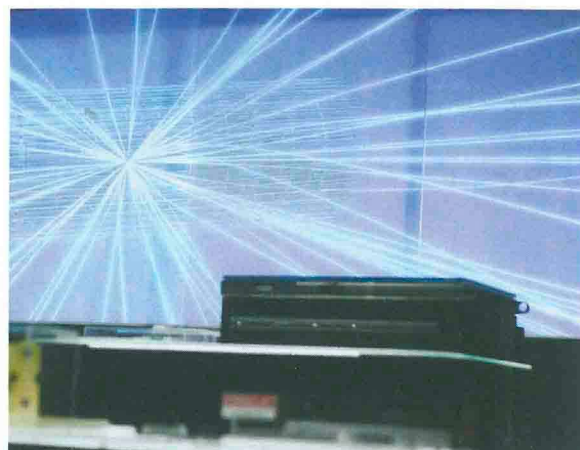
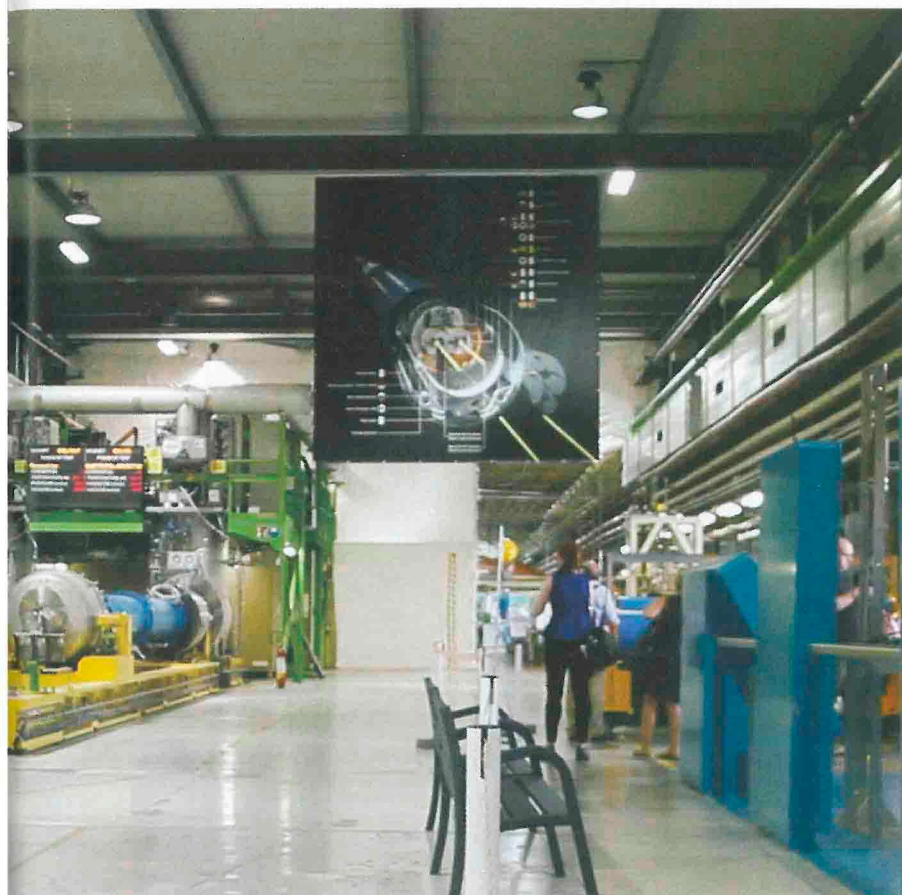
Kaufland uses Blue Yonder's algorithms, which can predict future demand based on historical data, to automatically replenish all products in its stores.

"The principle is to learn from the historical data of a retailer each day to make a prediction

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for retail



WATCH THE VIDEO



Professor Feindt guided *Retail Week* around Cern and explained how tech from the institute will kick-start dynamic pricing and remove gut feeling from 99% of operational decisions. Watch the video at: Retail-week.com/cerntechnology

of how much will be sold tomorrow or in a week – and this can be learned completely automatically by the software,” says Feindt.

“This will not be one number. It will be a complete probability distribution of all the possible futures.”

Feindt explains that this probability distribution allows retailers to make a mathematically optimal decision, which humans cannot do “because it is way too complicated”.

Variables such as the weather forecast can be plugged into the algorithm to make it even more effective.

Feindt believes 99% of operational decisions can be made using his company’s algorithms and gut instinct is now “redundant” in retail in everything but strategic decisions.

Alongside making predictions about demand, the software also calculates the optimal price of a product in real time based on any number of variables.

Feindt does not believe consumers are perturbed by constantly altering prices, as long as they are all getting the same deal.

“Relatively conservative German companies have tried dynamic pricing and they were very much afraid of how the customers would react,” says Feindt. “So they monitored it very strictly when it first trialled and the funny thing is there were no complaints.”

Feindt argues retailers should not change prices based on the customer’s profile. This approach backfired when Amazon tried offering customers different prices based on whether they were using a Mac or a PC.

Retail revolution

Generations behave differently and Feindt believes millennials are more open to innovations related to data because they grew up with the internet.

Introducing machine learning and artificial intelligence to retail through algorithms could have the same disruptive effect as the

advent of the World Wide Web, according to Feindt.

“You can’t sit back and say ‘I have been in the market for 150 years and nobody can do anything [to disrupt us],’” says Feindt. “That is not true in the digital world because things can change from today to tomorrow.”

He believes retail is braced for the same revolution experienced by the private taxi transportation industry since the arrival of Uber, which has based its business upon data and automated decisions.

“It will come,” argues Feindt. “It is only a question of do people realise it early enough to save their business or not.”

There has often been speculation that the Large Hadron Collider could accidentally create a black hole that will bring about Armageddon.

If Feindt’s warnings are to be believed, the science from Cern could precipitate a cataclysmic end for retailers that fail to prepare for the new ways of working.