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Model shoppers - What is it that makes us pick goods off the shelves?

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THE supermarket giant Sainsbury's is building a computer model that simulates in minute detail the operation of one of its London stores. The aim is to make more accurate predictions of customers' buying patterns. Details of the model, called Sim Store, are due to be released this week at a conference on complexity theory organised by the oil company Shell.

Supermarkets are carefully laid out to encourage shoppers to buy as much as possible, but stores can still be caught out by sudden changes in buying behaviour. To learn more about how people choose what to buy, Sainsbury's is modelling customers' actions as a complex adaptive system. "It's part of our quest for insights into customer behaviour in stores," says Mark Venables, leader of the project at Sainsbury's.

Many different forces interact to create the behaviour of customers in a supermarket, Venables says. You can study customer behaviour with surveys, focus groups and videos of how shoppers move around the store and what they buy, but this approach is limited, he says. "Unless you build a mathematically based computer model you are only going to be analysing a small number of the dimensions of this behaviour."

To try and model buying behaviour more accurately, Venables has been working with John Casti from the Santa Fe Institute in New Mexico. The simulated shop is an exact replica of a real store even down to the layout of goods on the shelves.

Into this model go "agents" —computer programs that model the behaviour of real shoppers wandering around the aisles. The agents have a variety of behaviour patterns. Some are more friendly than others and will spend time "talking" to agents they recognise. Others will act like parents with children and move around the store slowly.

Each agent has a shopping list created with data from the real store about what people are currently buying. Every agent has a shopping strategy, determined by how people react to the different forces. Venables says that the main forces on shoppers are the customers' own likes and dislikes, the impact of advertising and promotional offers, and the range of goods in a store and how it is laid out.

Using information about the behaviour of real shoppers, Venables has drawn up a set of rules determining how the agents react. Each run of the model simulates a four-hour period in this supermarket when 2000 agents will do their shopping.

Venables says that as the agents adapt to the layout of the supermarket useful data about shopping behaviour will emerge. He expects to find out which shoppers are happiest with the layout of a store and find it easy to fulfil their shopping strategy.

"We think we are laying the store out in such a way that customers will feel happy and be encouraged to buy things but we do not really know," Venables says. By changing the layout of the shop the company might be able to increase the amount of money that shoppers spend. He says that it also might be able to forecast sudden surges in buying, so the supermarket isn't caught with empty shelves.

