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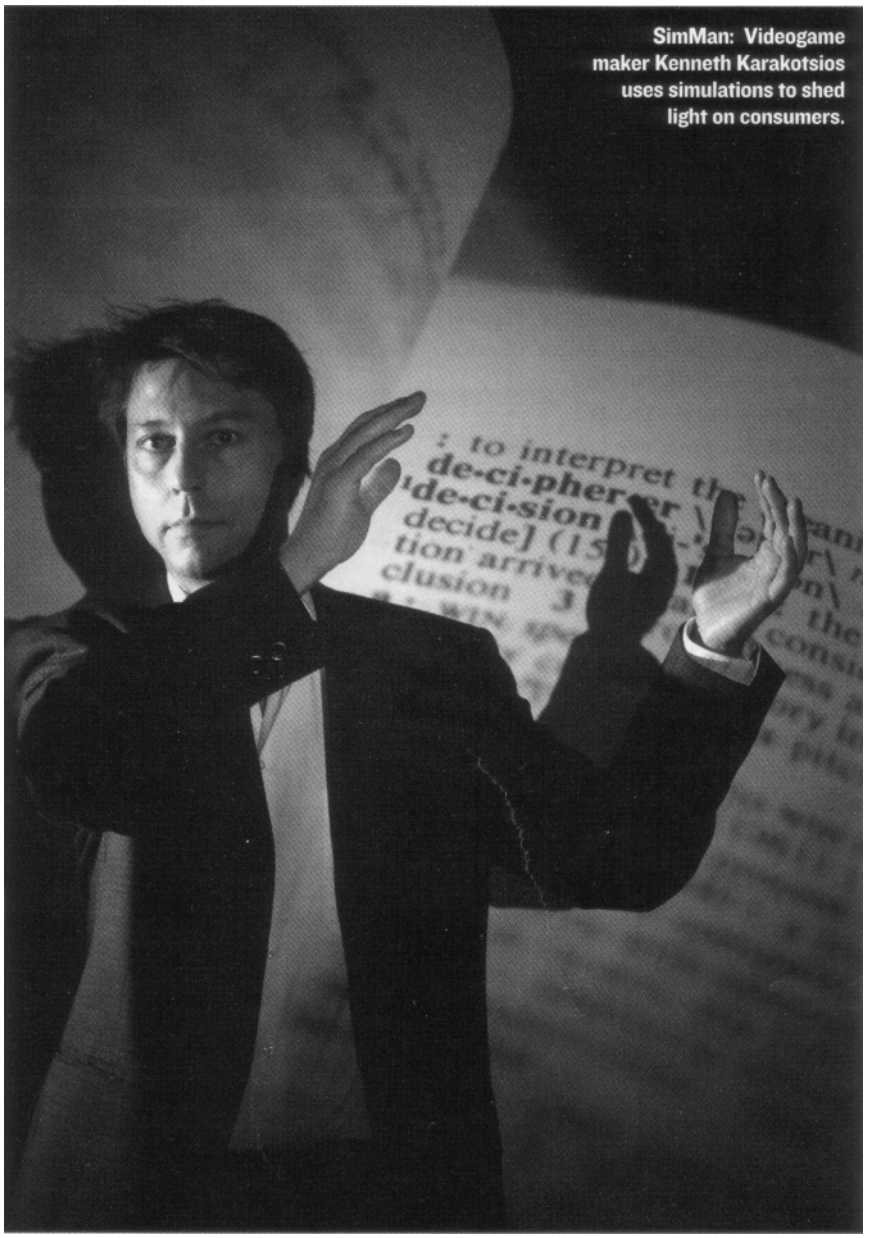
CONSUMER BEHAVIOR

Game Theory

Inspiration for the next Coca-Cola or Unilever marketing campaign might come from a computer game that looks an awful lot like The Sims

By Allison Fass


SimMan: Videogame maker Kenneth Karakotsios uses simulations to shed light on consumers.

Marketing

WILLIAM BEAN, A Research director at Pepsi-Cola North America, is fascinated by vending machine use in a mythical suburban office. There 35 sales, technology and administrative employees work, gossip—and quaff lots of soda.

These thirsty workers are characters in a simulated test market on Bean's desktop computer in Purchase, N.Y., and they are supposed to give Bean, a former biologist, insight into soda consumption. The employees, or "agents," as they are called among computer-simulation experts, are programmed to act like office staffers and consumers. They are directed to move and interact in response to simple rules (drink when thirsty, for example) but with an element of chance injected. It's a toss-up whether an agent, confronted with a vending machine in an office lobby,

will buy a soda.

SimCity for marketing managers. Thus does Pepsi aim to study how customers react and adapt when it changes the number and locations of vending machines in the office. It hopes to take some of the guesswork out of placing the machines.

"The rules are not deterministic," says Bean, referring to the fact that the course of events can take a different path every time the game is played. "The only way to figure out what happens is to allow the agents to behave in the same way a market behaves."

It is like a real test market, only faster and cheaper. Bean, working with marketing consultant ThinkVine of Cincinnati, learned through his agent-based model that putting a single vending machine in a place where people tend to gather can generate 15% more sales than putting multiple machines throughout an office based on the number of people there. Pepsi is now urging 120 bottlers in North America to reevaluate their vending programs, a move expected to bolster this profitable but slow-growing channel.

It's easy to understand why Pepsi and a lot of other marketers are excited about agent-based modeling. The analytical technique, which is like a videogame without controlling players, helps companies forecast consumers' individual and collective response to new product offerings, price changes, media buys or marketing pitches. It also tracks how the agents influence one another, a big selling point as marketers seek to understand and sway targeted groups of consumers by using specialized appeals, such as word-of-mouth campaigns.

"The model replicates the way consumers are making decisions," says Kenneth Karakotsios, head of DecisionPower, a company in Campbell, Calif. that peddles agent-based software.

Karakotsios claims that his software helped Coca-Cola successfully change its marketing strategy in Morocco last year. Concerned about a flurry of new competitors, the soda company used agent-based modeling software to plot sales for 18 soft drink brands, including Coke, Pepsi and some indigenous Moroccan offerings. It then incorporated dozens of brand and media preferences for 28,000 consumers, each representing 1,000 Moroccans, segmented by age, gender and social class.

Coca-Cola was inspired by this exercise to boost its marketing budget for Fanta in Morocco by 40%. It shifted ads for Coke from TV to radio and billboards. And after learning simulated consumers would pay more for Hawaii and Porn's, two Coca-Cola brands sold in Morocco, the company increased prices by as much as 10%, says Othman El Ouazzani, knowledge and insight manager for Coca-Cola in North and West Africa.

DecisionPower aims to collect a total of $2 million this year from 13 marketers that want custom models of MarketSim, DecisionPower's software. Among them: Procter & Gamble and Tokyo ad giant Dentsu. MarketSim, which costs $100,000 to build and $90,000 to license annually, was created by Karakotsios. In 1992 he came up with SimLife, a videogame that simulated an ecosystem where virtual plants and animals had adaptive abilities. SimLife, which sold a million copies and earned Karakotsios $650,000 in royalties, was a precursor to The Sims, the Electronic Arts videogame with characters that eat, sleep and socialize on their own.

Agent-based modeling was pioneered in 1968 by economist Thomas C. Schelling, who used coins and a makeshift checkerboard to show how segregated neighborhoods could come about as a result of individual preferences, not racism. Since then it has been used to analyze stock market bubbles, traffic jams and risk in the insurance and gaming businesses. In recent years such outfits as Ford Motor and Procter & Gamble have used agent-based models to evaluate supply chains and popular combinations of product features. Unilever is using agent-based modeling software to analyze the purchasing and social patterns of 150,000 customers in Switzerland who use online grocer LeShop.ch. Working with Eurobios of London, it tracks how shoppers influence new users and affect sales of new products, data Unilever can use in future product rollouts to help plan pricing, packaging and, perhaps, to engineer word-of-mouth campaigns.

Virtual reality: Pepsi studied vending sales in a simulated office like this.

'The model replicates the way consumers are making decisions"

"Why do you buy one shampoo over another? Somebody might have told you to," says Shail Patel, a senior researcher at Unilever. "That is pretty much completely

disregarded in traditional marketing research."

Doubters aren't convinced that they can make important decisions based on computer simulations. "Everybody's kids are running around playing the videogame; it's hard to go in to a company and say, `We're going to use The Sims to solve your problems,'" says Robert Caprara, senior vice president for market research and advanced analytics at ImpactRx, a consultant in Mount Laurel, N. J. that has used agent-based modeling to analyze drug sales.

Computer modeling is also subject to human bumbling, since its rules and mathematical probabilities involve intuition and hypotheses. Says Eric Bonabeau, founder of Icosystem, a tech consultant: "An agent-based model will only be as accurate as the assumptions and data that went into it."

In other words, even as companies try to make marketing more scientific, it remains an art.

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