

Technology

SOFTWARE

Shelf Smarts

Some obscure math developed during the Cold War made Circuit City \$300 million in extra revenue last year.

BY BRENDAN COFFEY

WHEN YOU WALK INTO ANY ONE OF the 626 Circuit City locations in the U.S., everything from the clothes the floorwalkers wear to how long you can get 0% financing has been studied and tweaked by statisticians relying on obscure mathematics developed during the Cold War to make atomic bombs.

The math is multivariable testing, or MVT, a way of testing dozens of variables simultaneously in real-life situations. Statistician Charles Holland first applied MVT to figure out why a certain atomic bomb part had a crippling 85% rejection rate in the late 1960s.

His privately held consulting firm, QualPro, in Knoxville, Tenn., has long sold MVT tricks to manufacturers to detect assembly line problems. But using it to get a

handle on the finicky shopper is a radical new step in retail, a business mostly run on gut instinct. In the past three years Holland has signed up chains such as Circuit City, Toys "R" Us, Staples and Lowe's. QualPro charges \$500,000 to \$3 million to run a six-week test of 20 ideas.

Circuit City, based in Henrico County, Va., has had jarring success with its statistical help. Two six-week studies in late 2000 and early 2001 led to changes that contributed an estimated \$300 million in sales for the 12 months ended September 2002, or 3% of the \$10 billion in revenue. "What did we learn about ourselves? That our gut stinks," says Circuit City senior vice president Jeffrey Wells.

That realization may be a lifesaver. In the past five years Circuit City has fallen

behind Best Buy. Facing pressure from Home Depot and Lowe's, the company dropped appliances in 2001, shaving off 15% of its sales. Its stock has fallen to \$5 from \$60 over the past three years. A much-needed store refurbishment cut earnings by 60% to \$30 million last year.

Circuit City turned to MVT at the behest of Chief Executive W. Alan McCollough, who had seen it work in his days at textile giant Milliken & Co. Frustrated in mid-2000 with the failure of other ideas to increase sales, McCollough gathered 3,000 ideas from store-level employees and whittled them to 15 for QualPro to test.

Circuit City randomly selected 16 stores for the experiment. The changes were either/or, and not all ideas were implemented in every store. Commissions were either flat or varied, based on product; employees wore either uniforms or street clothes; 0% financing lasted for 12 months or 24 months.

Each of the 16 stores tried a different combination of the 15 ideas. In this way a lot of interactions can be tested at once (maybe the commissions only motivate uniformed sales clerks?). Data on sales and net margins at each store were tallied weekly. After the best-performing recipe was identified, Circuit City and QualPro fine-tuned it by eliminating those changes that had no impact when compared with the status quo.

The results stumped everyone. Executive favorites, like adding more salespeople to help customers, had no effect on revenues. Flat commissions worked better than the chain's product-based commissions, a tradition for 48 years. In retrospect that change seems an obvious one: The pitchman can focus on what the shopper wants instead of pushing a high-commission flat-screen TV.

Circuit City later decided to drop commissions altogether. After the retailer instituted MVT-validated concepts in stores, it saw an immediate 3% comparable-store sales rise. It tested the changes three separate times to make sure the benefits were real.

"Vice presidents and janitors are equally likely to have an idea that has a positive impact on a problem," says Charles Holland. Math is the great equalizer. **F**



Analyze this: Circuit City unleashed statisticians on its stores in a bid to boost sales.