



CYDNEY SCOTT/Staff Photographer

Shashi Mehrotra of Legend Advisory Corp. created Asset Allocation Neural Network, an artificial intelligence program.

Ann zips through stock and bond analysis and decides how clients should move money among investment types.

## When it's time to invest, Gardens firm turns to Ann

By JEFF OSTROWSKI  
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PALM BEACH GARDENS – Investment strategist Shashi Mehrotra has been trained in the bloodless sciences of mechanical engineering and portfolio management, but he makes no attempt to hide his admiration for Ann, his exceedingly logical office mate at Legend Advisory Corp.

Mehrotra taught Ann everything she knows about analyzing markets, but it's clear who calls the shots about Legend's \$1.5 billion portfolio.

When he and Ann disagree about a decision – perhaps she thinks it's time to trim holdings in foreign markets and move the proceeds to U.S. large-cap stocks – Mehrotra has learned to let her have her way.

"Nine out of 10 times, I'm wrong, and she's right," he said recently

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SHASHI MEHROTRA  
Investment strategist, Legend Advisory Corp.

from his office, as Ann sat silently nearby.

Maybe that's because Ann doesn't get caught in the emotional traps that snare so many investors. She doesn't watch CNBC, and she doesn't mind betting against the crowd.

"She doesn't have any attitude. She doesn't get tired," Mehrotra said

of Ann. "She's fearless, she's emotionless, she's greedless."

She's also a computer model. Mehrotra has spent more than a decade creating and tweaking what he calls his Asset Allocation Neural Network, AANN by her initials and "Ann" in conversation.

Legend Advisory Corp. is a Palm Beach Gardens-based division of mutual fund company Waddell & Reed (NYSE: WDR, \$25.24) of Overland Park, Kan., and it kept Ann's role hush-hush for years.

But Legend announced Ann's existence to the world in May, when the company told financial writers that it had spent some \$10 million to develop the piece of artificial intelligence. She's not much to look at. You could even say she blends in, since she resides in Mehrotra's office computer.

Skeptics say Ann is part of an AI fad that's sweeping Wall Street with too much sci-fi fanfare and too little practical use.

"Artificial intelligence is a bit out there in terms of investing people's money," said Bob Garvy, head of Intech, a Palm Beach Gardens-based division of Janus Corp. (NYSE: JNS, \$27.11) that manages \$70 billion. "I have a very high degree of skepticism, let me put it that way."

But Mehrotra sees Ann as the future. Her algorithms let her mimic the human brain – albeit a super-charged brain that quickly analyzes stock and bond markets and the arcana of yield spreads and money flows. Ann grows smarter, Mehrotra said, as she gains experience, and he said she beats the market's returns while cutting the gut-wrenching risk in the marketplace.

As computer models and high-level math grow increasingly common in the world of investments, artificial intelligence could be the next frontier for investors. Among those testing the waters is American

Century Investments of Kansas City, Mo., which uses a neural network to pick stocks for several of its funds. Its tiny Newton Fund, with only \$7 million, is run entirely by artificial intelligence.

American Century's artificial intelligence system can look at thousands of stocks and cull 10 that best fit the fund's goals, said fund manager John Small.

For human analysts, he said, "That would be a lot of charts to look at."

While big-money players are secretive about their use of artificial intelligence, there are whispers that New York hedge fund Renaissance Technologies, headed by billionaire math whiz James Simons and staffed by a group of number-crunching Ph.D.s, is using AI. The fund has invested a reported \$600 million in its math models.

Of course, math-geeks-turned-investors have a spotty reputation. Hedge fund Long-Term Capital Management famously went bust in 1998 in spite of the mathematical rigor it applied to its positions in interest-rate derivatives and currency swaps.

Legend is no swash-buckling hedge fund, though. Its portfolio consists in large part of retirement money invested by teachers and other public employees.

Rather than shoveling money into exotic financial instruments, it sticks with staid mutual funds.

Ann doesn't pick stocks, Mehrotra stresses. Once a month, she analyzes 32 pieces of complex

market information, then decides how Legend's clients should move their money among seven types of investments: large-cap stocks, small-cap stocks, investment-grade bonds, junk bonds, international bonds, international stocks and cash.

Mehrotra, a 40-year-old who was born in India and holds an MBA from Florida Atlantic University, said Ann has established a stellar track record.

From March 31, 2004, to March 30, 2007, her all-stock fund returned an average of 14.93 percent a year, compared to the Standard & Poor's 500 Index's 10.06 percent.

While Mehrotra has relied on Ann's calls more and more over the past decade, she's not Legend's only decision maker.

Legend's analysts modify Ann's calls based on the amount of risk its investors are willing to take.

And while Ann's bullishness on emerging markets – high-growth, high-risk economies in Latin America and Asia – had her urging Mehrotra to make big bets there, he took more modest positions.

"We're investing people's life savings, so we've got a tremendous amount of risk controls," Mehrotra said.

In other words, natural intelligence is still watching over Ann's artificial brain.

So is Ann the future of investing, or is she just a fad?

Intech's Garvy said there's a big leap from the tried-and-true stochastic

calculus Renaissance Technologies relies on to the artificial intelligence used by Legend.

Pamela Peterson Drake, a finance professor at Florida Atlantic University and a chartered financial analyst, likewise is dubious.

"While they are quite interesting, the use of neural networks would not likely provide any superior returns to investing," she said.

That's because no model can predict the illogic that's inherent in investment markets, she said.

"Applying neural networks, which is a form of artificial intelligence, would not be appropriate for stock selection because the market does not follow the basic neural networks that can be modeled," according to Peterson Drake. "The market is not a being, but rather is a reflection of a dynamic conglomeration of different human psychologies."

Mehrotra doesn't begrudge the doubters for being skeptical.

After all, he said, AI is so new that there's no guarantee it'll work.

He also sees Ann as a threat to Wall Street jobs. With Ann as its workhorse, Legend employs far fewer analysts than a typical portfolio manager.

But he hopes that artificial intelligence will become an accepted way to help everyday investors boost returns and reduce risk.

"If this takes off," said Mehrotra, "it will change the investment landscape."

## Artificial intelligence

Legend Advisory Corp. isn't the only Florida firm pushing the boundaries of artificial intelligence. Other AI efforts include:

- MAKO Surgical Corp. The Fort Lauderdale company says its robot makes knee-resurfacing operations more precise, cutting hospital time and speeding recovery. MAKO uses technology licensed from the Massachusetts Institute of Technology's Artificial Intelligence Lab.
- MEDai. The Orlando company's 'predictive model' helps hospitals forecast costs and study patient patterns.
- Guardian Solutions. The Bradenton company's so-called intelligent video system watches for suspicious activity at ports and military bases. While the video doesn't entirely replace humans, it acts as a 'wake-up call' that calls attention to potential problems, President John Montelione says.
- The Florida Institute for Human and Machine Cognition. Dr. Ken Ford runs the Pensacola nonprofit. Its scientists have worked on projects for NASA, the National Science Foundation, the military, Sun Microsystems, IBM, Nokia, Lockheed, Raytheon and Boeing.
- The Florida Artificial Intelligence Research Society. This statewide group, run by professors at the Universities of Florida, Central Florida and Miami, hosts an annual conference and encourages members to share their research. UM Professor Geoff Sutcliffe, for instance, says he has developed AI that NASA uses to find software bugs.
- Tampa Electric. Back in 2002, the division of TECO Energy began experimenting with a neural network to boost the efficiency of its coal plant at Big Bend. The first attempt met with 'mixed results,' spokesman Rick Morera said, and Tampa Electric is testing a new neural network. It bought both systems rather than developing them itself, he said.

—Jeff Ostrowski, Rachel Schaff and Niels Heimeriks

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