

# Key to Netflix's future: better recommendations

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In this March 20, 2012, photo, Netflix executives John Ciancutti, left, and Todd Yellin chat in front of a board of ideas inside Netflix headquarters in Los Gatos, Calif. A big part of Netflix's future rides on how much Ciancutti, Yellin and about 150 engineers can improve the software that draws up lists of TV shows and movies that might appeal to each of the video-subscription service's 26 million customers. Netflix has spent 13 years learning viewers' disparate tastes so it can point out movies they might enjoy. (AP Photo/Paul Sakuma)

(AP) -- Netflix executives John Ciancutti and Todd Yellin are trying to create a video-recommendation system that knows you better than an old friend. It's a critical mission as Netflix faces pressure from its Internet video rivals and subscribers still smarting from recent price hikes.

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shows and movies that might appeal to each of the video-subscription service's 26 million customers.

[Netflix](#) has spent 13 years learning viewers' disparate tastes so it can point out movies they might enjoy. It has become good enough to figure out which romantic comedies might still appeal to subscribers who favor action flicks.

Netflix says three-quarters of what people watch now come from such recommendations. But as subscribers shift from getting DVDs through the mail to the instant gratification of Internet viewing, Netflix needs to make those suggestions even better.

The goal now is to learn individual viewing preferences so well that every recommendation is a hit with that subscriber, says Ciancutti, Netflix's vice president of product engineering.

If Ciancutti can get the system right, Netflix can direct people to movies and [TV shows](#) it already has. That will keep customers happy and help limit how much Netflix has to spend to obtain rights to additional online video.

If he gets it wrong, customers will be more inclined to search for something and become frustrated when they can't find it. That's a real concern because Netflix's [online library](#) doesn't offer as comprehensive a video selection as the DVD service the company wants to phase out.

"We are using all of our best ideas right now, but I know a year from now, I am going to be looking back and saying, 'Oh wow, we didn't have this feature or that feature,' and I will be really embarrassed," Ciancutti says.

Ciancutti invented Netflix's original [recommendation system](#), which was

mostly based on the ratings of customers willing to share their opinions about DVDs.

When he first started out, Ciancutti just wanted to come up with a system that didn't recommend DVDs in short supply or movies that a subscriber had already watched. The recommendations have become progressively more sophisticated as more people signed up for Netflix and engineers got more data to crunch and feed into its computer formulas.

But the company's engineers always realized they weren't getting a complete picture. Those discs may have sat around for weeks or might not have ever been watched in their entirety. And many customers have never bothered to rate movies.

Ciancutti believes the recommendations should get better now that more people are turning to online viewing. Since Netflix introduced its streaming option five years ago, billions of hours of video have been watched to give the company's engineers more insight into how and when customers use the service.

With streaming, Netflix no longer needs customers to give feedback. Its computers log whether someone mostly watches comedies on weekends and dramas after work, and whether the entire movie gets watched. It knows which customers tend to devour multiple episodes of TV comedies in a single viewing session. It can tell whether someone tends to rewind movies when certain actors appear.

"The signals we are getting about what people are watching, when they are watching and how much they are watching are much richer than ever before," says Neil Hunt, Netflix's chief product officer.

But the science remains imperfect.

Netflix subscriber Sanchita Gupta still gets confounded by some of the suggestions after eight years as a customer.

"The recommendations are OK, but sometimes they are completely off the mark," Gupta says. "Just because we watched 'Office Space' doesn't mean we want to see 'Austin Powers.' I think those are two very different comedies."

Netflix learns from those misses.

"When you are running as fast as we are, I want us to fall on our fanny sometimes," says Yellin, a former filmmaker who is Netflix's vice president of product innovation. "You get better by grinding out the improvements one yard at a time."

If Netflix can deliver more accurate recommendations, it will have an even better chance to fend off smaller streaming rivals, including Amazon.com Inc., Wal-Mart Stores Inc.'s Vudu and a forthcoming venture backed jointly by Verizon Communications Inc. and rival DVD rental service Redbox.

Competitors don't know as much about viewers' preferences because they haven't been analyzing them for as long as Netflix Inc. The Los Gatos, Calif., company has accumulated more than 8 billion ratings on a one- to five-star scale since it began working on its recommendation system in 1999.

"It's a significant advantage, and it will be difficult for competitors to catch up," Piper Jaffray analyst Michael Olson predicts.

Netflix subscribers are still rating millions of DVDs each month. That system works fine for DVDs, but that's becoming less of a concern for Netflix as it tries to wean customers off the discs, which are expensive to

mail back and forth.

Internet video is cheaper to deliver, but it comes with up-front investments. The costs of obtaining online rights for limited time periods are higher than buying DVDs, which can be rented out indefinitely. Movie and TV studios have been steadily raising their online licensing fees as video streaming cascades into more households.

Netflix already has signed contracts requiring it to pay nearly \$4 billion for online licensing over the next several years. That rising cost is the main reason Netflix expects to lose money this year for the first time in a decade. It's also a big reason Netflix raised U.S. prices by as much as 60 percent last summer, resulting in a consumer backlash.

Netflix's promise not to further raise prices increases pressure on the recommendation system. The company already has accumulated more than 140,000 movies and TV episodes on DVDs, compared with an estimate of more than 60,000 titles for online streaming. Customers are less likely to notice that gap if they keep seeing recommendations that appeal to them.

Gupta's experience exemplifies the phenomenon. When she searches for something to watch, she often becomes disappointed with slim pickings in suspense and mystery. But she sticks with Netflix because 80 percent of the time, she and her husband find something they want to watch from Netflix's recommendations.

Netflix's computer formulas now sort subscribers into one of thousands of clusters created by Netflix to distinguish certain viewing patterns.

This process starts as soon as a customer signs up and fills out a 22-question survey. The responses are tied to the viewing preferences of existing subscribers who had given similar answers. If it turns out those

existing subscribers watched and liked "The Big Lebowski," then the new customer might, too, even if comedies weren't a stated preference on the survey.

The data analysis also customizes Top 10 lists for each of Netflix's online video subscribers.

As Netflix learns more about each subscriber, the suggestions aim for even narrower targets. Netflix does this by breaking down its recommendations into esoteric categories such as "Emotional period pieces featuring a strong female lead" and "Critically acclaimed, gritty foreign movies."

"Some of this is what I call `kitchen engineering,'" Yellin says. "We throw in a little bit of salt, a little bit of pepper, a little bit of lemon juice and see if it works."

Netflix has always looked for new ingredients to cater to the specific tastes of different viewers. For instance, it once offered \$1 million to any engineering team outside the company that could use its viewing data to improve the recommendation system by at least 10 percent. The contest drew about 50,000 participants, and the winning team took nearly three years to get there.

Netflix is trying to make improvements far more quickly these days, striving to reach a goal that could fit into the category of "Far-out fantasies featuring computer-coding geeks."

"My Utopian state would be for us to understand our subscribers so well that we can eventually just put one recommendation on the screen with nothing else there but a play button," Yellin says.

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