THERE'S AN APP FOR THAT

The technology exists to predict what music and movies customers will enjoy, but nothing similar has existed for wine. Until now. Felicity Carter meets Amy Gross.

By the time Amy Gross had come to the end of her first day in the Napa Valley she had tasted up to 30 wines. Later, when she was comparing notes with her husband, Gary, she wondered how she was going to keep track of them all.

"No problem," she thought. "There's an app for that."

It was 2009, and the number of apps were exploding. Yet, although Gross found apps that would recommend wines based on other consumers' ratings, or make suggestions for specific occasions, "there really wasn't anything that would tell you what you personally would like."

Gross knew that music apps had been created where a trained musicologist had been able to analyse the fundamental traits of specific music pieces so the app was then able to recommend examples with similar traits. "I thought, surely music is so complex that if music can be done this way, then there must be a way to do it for wine," says Gross. She talked about it to her brothers-in-law: Steve Gross the wine lover and Scott Gross the programmer. A year later, "we came up with a duct tape version of an algorithm called Wine4. Me, and it kind of worked."

Yet, it was limited. The team – which now included Michael Tompkins, a data scientist – discovered that sensory data on individual wines didn't exist, while critics' and consumers' notes weren't consistent, and

Dr Anna Katharine Mansfield, Associate Professor of Enology, Cornell University

were frequently inaccurate. To build the app she wanted, Gross needed to create wine sensory data from scratch.

Her next step was to learn about wine, its attributes, and how people go about choosing it, so she started a wine blog. It was called VineSleuth Uncorked, named after her new wine data company.
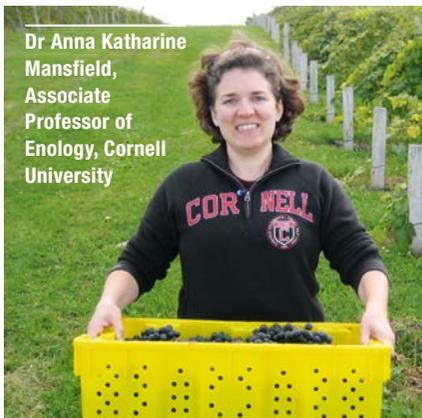
Sensory science

In 2012, Gross approached some winemakers in the Finger Lakes region of New York and presented her app idea to them. "I didn't know whether they would like the idea of using science with their art," she says.

"We want the right people to be introduced to our wines, so absolutely we think this is a fabulous idea," they said, and offered an introduction to researchers at the Sensory Evaluation Program in the Department of Food Sciences at Cornell University.

At Cornell, Gross met Dr Anna Katharine Mansfield, Associate Professor of Enology, who agreed to help create rigorous sensory data for each of the wines to be loaded into the app. First, Dr Mansfield worked with a small group of winemakers to determine the defining wine characters that would be apparent to consumers, such as 'apparent sweetness', as distinct from sugar, and 'palate weight'.

Dr Mansfield says that expert tasters taste in the opposite ways to non-experts. "The more expertise you have, the more your brain looks holistically at the wine," she says. "The brain will say, 'Oh, I think this is a typical Pinot Noir' and will then fill in typical descriptors." So, while an expert's brain comes up with the answer and then fills in the workings-out, a less-experienced person simply concentrates on specific attributes.

Once the lab team had created a list of descriptors they believed most consumers would be able to smell or taste, a panel of 36

Amy Gross, founder, VineSleuth

wine writers, wine makers, and sommeliers was asked to evaluate 100 of the most widely distributed, bestselling wines in the US. The wines were chosen from a wide range of price points, and the panel ranked them on attributes according to intensity. The tasters were given each wine twice, and were tested rigorously for their ability to repeat their results. "Once they evaluate the wines, they have to say the same thing to an accuracy of 90% or higher, and they have to cluster with the rest of the panel without communication," says Gross. "So we could serve the same wines multiple times, we bought 800 bottles. My husband said it was bigger than our wedding."

Tasters were used rather than chemical analysis, says Dr Mansfield, because "instruments like chromatography units take the wine and break it into individual pieces, and the researcher has to try to determine which compounds have high enough concentrations to be aroma active." The problem is that combinations of compounds create new characters, making the sum of the characteristics greater than their parts. "We could start with the wine and analyse it to death and try to figure out which compounds are odour active, or start with the person interacting with the wine and work out what they're smelling."

Once the wines were characterised, a statistical analysis team went through the data and removed any tasting results that were inconsistent. The remaining data was added to the app. "You tell us what wines you like and don't like, scoring from zero to five if you like." The app analyses the wine characteristics, builds a taste profile for the user, and uses it to recommend wines. "It's pulling in all the characteristics from all the wines that we have in any history for you, and looking for the similarities between those. It might be palate

weight or a flavour characteristic."

Next, the lab trialled a group of consumers. Everyone got to taste wines and rate them, and then the algorithm suggested a different group for them. Their scores were checked to ensure that they did, in fact, like the wines that were recommended for them.

By the time it launched to the public in 2014, the free Wine4.Me app had 1,260 wines in its database. Gross acknowledges its limitations; it does not, for example, tell consumers where they can buy the wines. Intriguingly, however, the team noticed the app was changing the consumer behaviour of those who used it consistently – they not only began rating wines more frequently, but also began to spend more on the wines they were buying. Consumer interviews revealed that consumers felt they could "spend an extra couple of dollars because they knew they would like it, thanks to the app. Spending was more safe."

Gross began thinking about how she could move into retail. "I was looking at some of the things that IBM was doing with Chef Watson and I thought, 'OK, IBM is also building things for retailers.'"

Pairing with Chef Watson

IBM Watson is a computing system that combines artificial intelligence with analytical software to answer questions posed in real language. In 2011, Watson won the million dollar prize on the game show Jeopardy!

Since then, Watson has been partnered with a number of institutions, including the food magazine Bon Appétit. To create the 'Chef Watson' app, the computer combed the magazine's archive of 10,000 recipes to analyse how recipes are created. Now a user can key in an ingredient they want to work with, the style of dish they're hoping to create, or simply the ingredients they have available, and Chef Watson will come up with recipe options and cooking instructions.

Although Gross thought IBM would be the perfect home for Wine4.Me, attracting the attention of a major technology company isn't easy. "I emailed them on a Wednesday afternoon and got an email back saying, 'Yes. Can you come to our office tomorrow at three o'clock?'" But at the meeting, IBM told her they still weren't sure what they were doing with Chef Watson. Undaunted, Gross went to an IBM conference and hopped up to the presenter – she

was on crutches – after his slot. He introduced her to other IBM executives, but they said, "We only work with big companies, so good luck. Go get some clients and we'll talk."

Gross persisted. Finally, in May 2014, Gross was introduced to Stephen Gold – the then chief marketing officer of Watson – who turned out to be a wine lover. "The next day, the guy who is heading up retail sales for Watson told me they had been trying to build a wine advisor for grocery stores but couldn't find anybody with wine data."

"We've got wine data!" said Gross.

At last, VineSleuth began working with IBM to create a retail system.

How it works

A customer will either use it online or at a kiosk in a store, if the store has either a loyalty card or the customer's purchase history. "The first time that you're using it, it might say, 'Thanks for coming back. These are the last five wines that you purchased. Did you like those wines?'" It would then bring up the labels to jog the consumer's memory. "Once you do that, it would say, 'OK, are you looking for a red, a white, or a pink wine today?' And it would take it from there." Eventually, the system will be voice activated. The screen offers sliders so the consumer can indicate how much acid, oak, or other characteristics they are interested in. The system will also suggest wines based on the customer's previous flavour history, and can even ask: "Are you serving this with a meal? What food would you be serving it with?" – and then make appropriate suggestions.

Since 2012, "we've worked with a team of sommeliers that have looked at recipes and then looked at the flavour data for the wines and then we've paired them individually," says Gross. Now, they are teaching Watson what flavour characteristics go together.

Many large retailers already have recipe databases – some chains even have in-house food magazines. "What we can do is take that recipe information and pair it with the wines they have for sale in their store," says Gross, thus boosting overall sales. Or wines could be placed strategically in aisles near key ingredients.

VineSleuth is now in discussion with several major retailers about installing the system. For VineSleuth to be useful and cost-effective – every SKU has to be described, and it's not cheap convening tasting panels, after all – the store needs at least 200 SKUs, because that's the point at which retailers generally have a wine adviser on hand to help customers. By the time a store has 2,000 SKUs, the programme becomes "extremely cost-effective and it helps put people in front of the right wines, and minimises that overwhelming feeling of being faced with a wall of wine."

Gross doesn't believe that VineSleuth will put sommeliers out of business anytime soon. "A sommelier adds to the dining experience," she says. "What I want to do is get people to understand what it is they're drinking, so that when they go to that restaurant, they're more comfortable talking to the sommelier. They have a little bit of a better understanding of vocabulary and they know what they like."

Gross is baffled, she says, that people are buying wines without any idea about what it tastes like. "They're just hoping they're going to enjoy it." She says she uses it all the time, mostly for food pairings. "If I'm supposed to buy white wine for dinner, I pull it up and look at the different flavour profiles."