

Drinks-On With the World's Biggest, Baddest Bartending Robot



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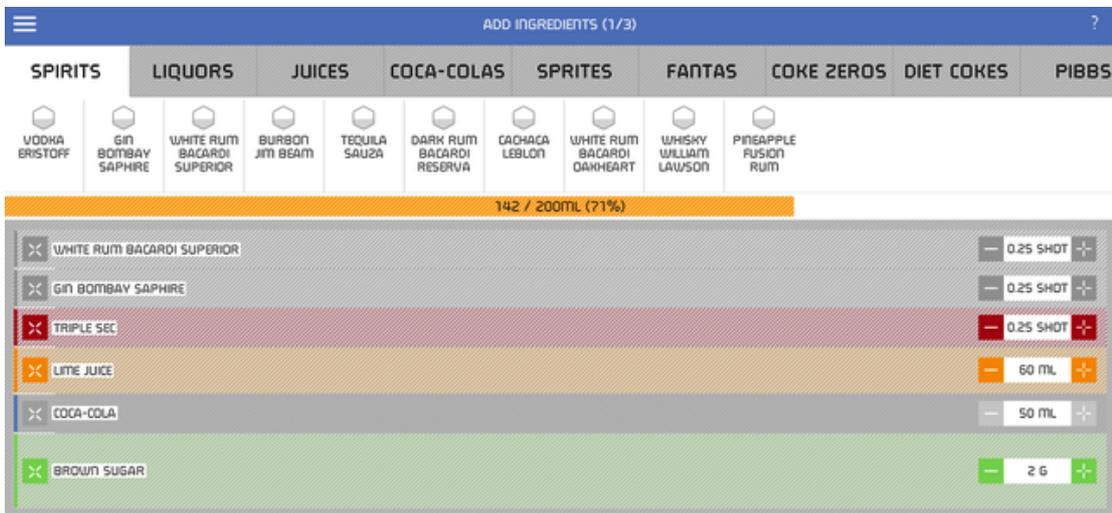
Friday 5:00pm

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At the Google I/O after party the other night, there was one bartender in particular that stood out. It wasn't the drink he made, or the friendly chatter. It was more than he weighed several tons and could break you with the flick of the wrist. Meet the Makr Shagr.

It's Friday afternoon, you've made it through the long week, and it's time for [Happy Hour](#), Gizmodo's weekly booze column. A cocktail shaker full of innovation, science, and alcohol. Do Androids dream of the perfect Manhattan?

Makr Shagr was designed at [MIT's Senseable City Lab](#) and produced and implemented by Carlo Ratti Associati in Italy, where it was built. Incredibly, this massive project went from concept to full implementation in roughly three months. The full rig weighs between five and six metric tons and made the voyage across the sea in a rather densely packed shipping container. It is simply the most advanced robot bartender we've ever seen.



Users download an app (at I/O they had a tablet with a scaled-back version of the app pre-loaded) and log in. From there, they can either take a drink template that already exists, or they can start from scratch. Makr Shkr partnered with Bacardi and Coca-cola, so there are roughly two dozen spirits and liqueurs, and over a hundred non-alcoholic mixers to choose from (Fanta Peach, anyone?). You pick your ingredients and the quantity of each that you want in it. You can also add solid ingredients such as a salt and pepper mix, granulated sugar, lemon slices, or even mint leaves. Your total drink will be up to 200ml (roughly 6.8 fluid ounces), when all is said and done.



Then you choose how the drink should be prepared (shaken, stirred, muddled, blended), name the drink, and submit it. Then the magic starts.

How It Works

Once you submit your drink order, that information is sent to a web server, which sends it back down to a local server on the Makr Shkr. That information is then split into two parts. One is the visualization system, which, along with the app, was made with partners from Pentagram and super über.

On the large screen behind the robotic arm you can see exactly what's going

into your drink when and what's being done to it as it happens. You can also see how many people are ahead of you and what the wait will be like. The other half of the data goes into the robotics systems.



Most prominent are the three robotic arms. These are [Kuka KR 16](#) robots, a pretty iconic symbol of the industrial revolution. You typically see these puppies in paint factories. They can lift 16 kilograms, they are unnervingly quick and incredibly precise (accuracy down to 1/10th of a millimeter). The two robots on the outside have cocktail shakers for hands (with lids that can close), while the one in the middle has a hand that holds and delivers the cups.

Behind the arms are a large network of taps, each of which are automated. Each spirit is housed in its own nitrogen-pressurized tank. Once the shaker is placed under the tap, an actuator opens the valve, and a pre-determined amount is dispensed. The Coca-Cola products are distributed in basically the same way. Ice, and other dry ingredients all drop in as they should. Behind the screen are two blades which hold and cut lemons into uniformly thick slices, and then drop it into your drink. It's incredibly sophisticated. There is also an immersion blender and muddler, for making drinks like piña coladas or mojitos.

Once all of the ingredients are in, the robot closes the lid on the shaker and either shakes it vigorously (and with a pretty good approximation of a human arm movement), or swirls it gently to give it a stirred effect. Truth be told, they make a bit of a mess, but hey, they're only three months old. They then pour the drink into the cup the middle robot is holding. That robot adds garnish as

necessary, and then places the finished drink onto one of five conveyor belts, which delivers the drink to the awaiting imbiber. The shaker is then rinsed off with a blast of water, and the process begins again.

There are some interesting things the software can do, too. "We want to make sure people use the Makr Shkr to drink responsibly," says Alessandro Incisa, Project Manager from Carlo Ratti Associati, who managed implementation. "It keeps track of the alcohol by volume of each drink it serves you. It could limit the number of alcoholic drinks each person has in a night." But because it's keeping track of percentages, it would be a dynamic number. For example you might be allowed 5 drinks that were 12 percent ABV over a given period of time, but only two drinks that were 40 percent. It can also count your calories, and if people punched in some vital statistics, the Makr Shkr could even estimate your blood-alcohol content (BAC) throughout the night.

At Google there was a limited subset of features, just because I/O was such a huge event and they wanted everyone to get a taste. In the app's full implementation you can filter by elements of the drink. This not only helps you discover a drink you might like, but it gives you a genealogy of that drink's creation. So, say you're looking for a drink with whiskey, and you discover a drink I created. You can see not only how my drink was made, but you can see the previous iterations of it and read my notes, "I liked it, but I think I made it a little too sweet this time." You can adjust it to further refine it. When you do, I'll get a notifications that the drink I've been working on has had another iteration. Maybe I want to try it. I go to the back and further refine it. Even if we never actually meet at the bar, and we don't know each others' names, we've created something together. It's about a participatory, democratized design.

Why It Matters

The Makr Shkr is not, as one might suspect, trying to replace bartenders. The drinks I sampled were, in general, decent. Or as decent as the person that created them envisioned them. But bartending is more art than science, and crafting flavors is still best done with a human touch. The MIT guys know that, and they don't want to change that. They aren't trying to make a better drink. Instead, the Makr Shkr is meant as an example—a microcosm, really—of some of the principals of the Third Industrial Revolution.

Industrial technology has progressed to incredible places, obviously, but according to Yaniv Jacob Turgeman, the project leader from the MIT side, we've been somewhat alienated from it. With Makr Shkr, they are using these incredible robotics—symbols of the industrial revolution—but they are made accessible. "Part of the idea is that anyone can control this powerful technology with something in their pocket," said Turgeman.

Carlo Ratti, the father of Makr Shkr who runs the MIT Senseable City Lab, agreed. This is intended to be an example of the new way things are 1. Designed, 2. Made, and then 3. Enjoyed. They chose drinks because within just a few minutes, people can go through the whole cycle. It's a fast and clean example, but of course that's just a small example.

"It could be designing a sandwich," said Ratti in our phone interview. "Or it could be designing a city or designing a building." He thinks that's a day we will see in our lifetimes. Something like a public square would be especially ripe for this philosophy, since so many people use it, it would make sense that more people could design together. That's exemplified in the Makr Shkr, too. Part of it is about social creation and consumption.

It means more to us when we participate in the creative process. It makes our drink (or house, or public square) not just more personalized to our tastes, but there's a sense that it *belongs* to us, because it's something that we created. When you apply these philosophies to production—a world we've come to think of as robotic—suddenly it becomes human again, because we can see ourselves in it.

Or maybe they'll just enslave us all using alcoholism.

Huge thanks to Carlo Ratti, Alessandro Incisa, and Yaniv Jacob Turgeman for their time.

Makr Shkr: Project concept and design by MIT Senseable City

Lab; Implementation by carlorattiassociati | walter nicolino & carlo ratti; Main partners - Coca-Cola and Barcardi. Technical partners - Kuka, Pentagram, SuperUber; Media partners - Domus, Wired; Top video by Brent Rose/Michael Hession; YouTube by MyBossWas; Event in collaboration with Meet the Media Guru, and endorsed by: Comune di Milano, World Expo Milano 2015 – Energy for Life. Feeding the Planet. Full credits available at www.makrshakr.com

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