THE **GUYS** WHO MADE **SIRI** ARE ON THE **VERGE** OF RELEASING **Optimizing** the **internet** that could, among other things, and capable. As with all **innovations** that claim to be

**VIV,** A WORD THAT CONJURES **LIFE** ITSELF. VIV IS A **WAY** OF UNDERMINE **GOOGLE** AND MAKE **YOU** FAR MORE **INTELLIGENT** Advances, however, there, um, might be **PROBLEMS**.









n anonymous green V marks the door of an ordinary office in downtown San Jose, California-inside, just a pool table, whiteboards scrawled with formulas, a dozen programmers working at computers with Nerf guns at their sides. The three founders gather in a glass-walled conference room. "What you're going to see here is a very early prototype," says Dag Kittlaus, the business guy. "This is only a few weeks old." (On the screen at the end of the room, a green Vappears. Green bars radiate, and then it connects. This is Viv. their bid for world domination. It's a completely new concept for talking to machines and mak-

ing them do our bidding-not just asking them for simple information but also making them think and react. Right now, a founder named Adam Cheyer is controlling Viv from his computer. "I'm gonna start with a few simple queries," Cheyer says, "then ramp it up a little bit." He speaks a question out loud: "What's the status of JetBlue 133?" A second later, Viv returns with an answer: "Late again, what else is new?"

To achieve this simple result, Viv went to an airline database called FlightStats.com and got the estimated arrival time and records that show JetBlue 133 is on time just 62 percent of the time.

Onscreen, for the demo, Viv's reasoning is displayed in a series of boxes-and this is where things get really extraordinary, because you can see Viv begin to reason and solve problems on its own. For each problem it's presented, Viv writes the program to find the solution. Presented with a question about flight status, Viv decided to dig out the historical record on its own. The snark comes courtesy of Chris Brigham, Viv Labs founder number three.

Now let's make it more interesting. "What's the best available seat on Virgin 351 next Wednesday?"

Viv searches an airline-services distributor called Travelport, the back end for Expedia and Orbitz, and finds twenty-eight available seats. Then it goes to SeatGuru.com for information on individual seats per plane, and this is when Viv really starts to show off. Every time you use Viv, you teach it your personal preferences. These go into a private database linked with your profile, currently called "My Stuff," which will be (they promise) under your complete control. So Cheyer is talking to his personal version of Viv, and it knows that he likes aisle seats and extra legroom. The solution is seat 9D, an economy-class exit-row seat with extra legroom.

Even at this most basic level, as Kittlaus points out, the implications of Viv are world-changing: Priceline pays Google about \$2 billion a year to get displayed at the top of cheap-flight searches. The entire Internet sales model is based on finding something, if you can find it, then going to the Web site or the app and looking some more and entering your dates and credit card. But Viv knows what Cheyer's looking for. It knows if he likes hotels with swimming pools and the best deals on his favorite entertainment options, even the airport he usually flies from. And although some

of this interactivity is already available on Google's Siri clone, Google Now, Viv also knows how to enter all Chever's personal data and credit-card numbers and execute the transaction-onestop shopping without the stop.

"It's that weaving together of services that creates this new paradigm that we think is going to take over," Kittlaus says. "It completely changes the way advertising works online. This will be the filter to you."

And how much is Viv going to charge Priceline?

"I don't know yet," Cheyer says. "But it'll certainly be far less than buying words on Google. That's why advertising completely changes."

But won't Priceline pay Viv to get higher in Viv's rankings? "We'll learn from the way that Google has done it," Chever says.

"We'll have, um, organic results."

And Google? Why haven't they sent out a hitman after you? "Well, they've sent people after us," Cheyer says. "They've showed a lot of interest in what we're doing-positive interest."

And Orbitz and Travelocity? If Viv goes direct to the data, who needs them? "Well," Kittlaus says, "they'll get involved, too."

Won't this be another death blow to the media, which has never been able to sell ads online? People really aren't going to want their phones singing jingles at them.

"I think the business models will change," Kittlaus says. And this may be the understatement of the Internet age.

> RIGHAM CAME UP WITH the beautiful idea, which makes its own perfect sense. Chever was always the visionary. When they met at SRI International twelve years ago, Cheyer was already a chief scientist distilling the work of four hundred

researchers from the Defense Department's legendary CALO project, trying to teach computers to talkreally talk, not just answer a bunch of preprogrammed questions. Kittlaus came along a few years later, a former cell-phone executive looking for the next big idea at a time when the traditional phone companies were saying the iPhone would be a disaster—only phone companies can make phones. An adventurer given to jumping out of planes and grueling five-hour sessions of martial arts, he saw the possibilities instantly-cell phones were getting smarter every day, mobile computing was the future, and nobody wanted to thumb-type on a tiny little keyboard. Why not teach a phone to talk?

Brigham, at the time just an undergrad student randomly assigned to Chever's staff, looked like a surfer, but he had a Matrix-like ability to see the green numbers scroll, offhandedly solving in a single day a problem that had stumped one of Chever's senior scientists for months. Soon he took responsibility for the computer architecture that made their ideas possible. But he also had a rule-breaking streak-maybe it was all those weekends he spent picking rocks out of his family's horse pasture, or the time his father shot him in the ass with a BB gun to illustrate the dangers of carrying a weapon in such a careless fashion. He admits, with some embarrassment, now thirty-one and the father of a young daughter, that he got kicked out of summer school for hacking the high school computer system to send topless shots to all the printers. After the SRI team and its brilliant idea were bought by Steve Jobs and he made it famous-Siri, the first talking phone, a commercial and pop-culture phenomenon that now appears in five hundred million different devices-Brigham sparked international news for teaching Siri to answer a notorious question: "Where do I dump a body?" (Swamps, reservoirs, metal foundries, dumps, mines.)

He couldn't resist the Terminator jokes, either. When the Siri team was coming up with an ad campaign, joking about a series of taglines that went from "Periodically Human" to "Practically Human" to "Positively Human," he said the last one should be "Kill All Humans."

In the fall of 2012, after they all quit Apple, the three men gathered at Kittlaus's house in Chicago to brainstorm, throwing out their wildest ideas. What about nanotechnology? Could they develop an operating system to run at the atomic level? Or maybe just a silly wireless thing that plugged into your ear and told you everything you needed to know in a meeting like this, including the names and loved ones of everyone you met?

Then Brigham took them back to Cheyer's original vision. There was a compromise in the ontology, he said. Siri talked only to a few limited functions, like the map, the datebook, and Google. All the imitators, from the outright copies like Google Now and Microsoft's Cortana to a host of more-focused applications with names like Amazon Echo, Samsung S Voice, Evi, and Maluuba, followed the same principle. The problem was you had to code everything. You had to tell the computer what to think. Linking a single function to Siri took months of expensive computer science. You had to anticipate all the possibilities and account for nearly infinite outcomes. If you tried to open that up to the world, ternet age.

to rule them all!



other people would just come along and write new rules and everything would get snarled in the inevitable conflicts of competing agendas-just like life. Even the famous supercomputers that beat Kasparov and won Jeopardy! follow those principles. That was the "pain point," the place where everything stops: There were too many rules.

So what if they just wrote rules on how to solve rules? The idea was audacious. They would be creating a DNA, not a biology, forcing the program to think for itself.

Again, Kittlaus saw the many possibilities. Google was teaching cars to drive. Artificial intelligence breakthroughs were exploding. The "Internet of Things" was the new buzzword, machines all connecting by WiFi to the magic of the Cloud. And everybody was after the final interface that would unite them, spending billions of dollars in the hope of harnessing the winning innovation to their specific platform. Soon, Google would hire AI legend Ray Kurzweil and buy him a \$500 million lab, and Facebook would spend another fortune on a team headed by NYU's Yann LeCun. But Viv was different. They were the little guy without big ties, and the idea of an open system was a hapkido move, leveraging their small size into something mighty. Their rebel DNA could work with all the platforms. And what medium could be easier than voice, their area of greatest expertise? One platform

They're joking, sort of.

They started out on pen and paper, breaking it down into the smallest possible pieces. You want the computer to do something, but you don't want to tell it how. It has to figure out that part for itself. So you start by teaching the program a concept, because a person can't act without a conception of where he's trying to go. Then you teach it an action. And you nudge it so that it finds its way from one to the other-which might just be the essential code of life itself, from DNA to the mysterious algorithms that unveiled the universe. from concept to the mysterious process that leads to action. If they could solve that, the program's brain could gobble up new concepts and actions until it contained ... well, everything.

But was it possible? They weren't sure. Chever and Brigham spent the next six weeks trying to figure it out.

Brigham's bachelor party in Denver that fall included some of the smartest minds in artificial intelligence and computer engineering. After the party, Brigham ended up at a bar with Mark Gabel, a young hotshot at the University of Texas with the perfect mix of expertise: artificial intelligence, natural language, and program analysis. "He was completely shitfaced." Gabel remembers.

"Wait, wait, don't tell him about that," Cheyer says.

Gabel laughs. "He actually tried to recruit Danny-the guy you just met-at the same time, but he was so messed up and incoherent Danny just said, 'This is a complete joke. I'm not going to sacrifice my career for this.' He's kicking himself now."

They stayed in the bar for hours, talking about atomic functional units and program synthesis. Gabel couldn't figure out where Brigham was going with it. Research in program synthesis was stagnant, stuck at tiny little functions. How could they do entire tasks?

Then he got it. A working-class kid who split his time between math and classical piano, Gabel had come to understand that complex systems were always the same-you had to start by making the problem more abstract. He could see the beauty of the rule behind the rules, not a model but a metamodel. They had to define the problem in such a way that it could be solved without solving the problem.

But he still wasn't sure it was possible.

They started meeting at Brigham's apartment. Gabel would fly out and they'd set up a whiteboard and draw equations, starting with seemingly simple problems. How could they make the jump from concept to action? On the most basic level, if they said, "Find parking lots near the White House," how would the computer figure out which white house you were talking about? It might find restaurants named the White House. But they couldn't tell the computer how to make the distinction without writing a bunch of codes.

Then the answer came to them—the glimmer of an answer, an elegant subplan that was like another little piece of DNA: Find the solution, it said, and stop there. "Intent representation," they called it. By latching the program to a goal, they gave it a kind of freedom.

At the start of January, they were ready to start coding. Seed money came from the richest man in China and Gary Morgenthaler, the first investor in Siri. "I looked at the work they were doing," Morgenthaler remembers, "and said, This is as good or better than anything I've seen in twenty years." They hired just two employees, Joshua Levy, a kindhearted, homeschooled midwesterner who started college at thirteen, and Marcello Bastéa-Forte, a rumpled Stanford grad who was already the top front-end engineer at Siri in his early twenties. In a small cubicle in a space in San Jose with "We tell our in-vestors they can take comfort that they're part of the beginning of the end," jokes Chris Brigham.

open ceilings, the smell of sawdust in the air, they wrote the basic

For the first demo, they gathered around the table and asked for

a simple weather report-and the program seemed to crunch along

forever, trying to come up with a way to come up with an answer.

Then it asked for more information because it was confused. The

Now the struggle against writing new rules became constant.

They'd find some gremlin creeping in, like local movie listings

in the middle of a flower search, and it was so tempting to just

ban movie listings from the middle of the flower search. But then

someone else would say "Find theater listing" and you'd have to

add another rule. Every time, like parents trying to raise imagi-

native children, they had to define correct in a way that made the

The solution was something they call the "planning objective

function"-but at this point we get into trade secrets, says Chey-

er. Or maybe religion. The point is, they did it. They created a pro-

gram that could write its own code and find its own solutions. They named their invention Viv, after the Latin for "life." If it worked

out in the marketplace and the feisty little improviser beat out the

coded fortresses of the giant players, Cheyer's dream would final-

ly be realized-he would make machines come to life.

For the next year and a half, they worked in secret.

code in a six-week push of furious coding.

Would it work? They still weren't sure.

program had intent! It wanted to do something.

program improvise.



is how the world will connect to Viv. After a simple fifteen-minute video tutorial, you open this training module-it looks like lozenges of text with some words highlighted-and teach it your specialized vocabulary. That knowledge goes to Viv's brain, which gets smarter with every new lesson. Say you own a companv called Wine.com and someone just asked Viv to find a good merlot-no, an awesome

merlot. Awesome is the kind of imprecise word an enthusiastic human might use. Does your database make it clear that *awesome* is a rating?

"Find an awesome merlot," Cheyer says.

Instantly, Viv figures "awesome" must fit into the "rating" concept. Apparently, someone already taught it the meaning of awesome.

Cheyer's a little disappointed. "If it were wrong," he says, "vou would literally drag and drop to teach it No, that's wrong."

And if you try to mess with it, Viv resists. Cheyer demonstrates by trying to teach it that a merlot is actually a kind of car.

"I'm not sure what you mean," Viv responds. "Please give a few more examples." In time, the hive mind will overwhelm mischief and human error. And all this requires no more skill than using a basic Web-site template, which hands the mysterious tools of artificial intelligence to ordinary people and lets them build on the contributions of all who came before.

Eventually, the Viv team hopes, its V will be everywhere. Press the V on your refrigerator and the fridge will say, Hello, how can I help, John? And you'll say, What is there to eat? And the fridge will see that it's lunchtime and ask if you want the usual cheese sandwich or something more interesting. You have ingredients that match a recipe for baked ziti on Ed*ible Gourmet. Should I download it?* 

*How long will it take?* 

You don't even have to say "How long will it take to cook?" because your fridge understands you. It knows you don't like to waste time in front of a stove. Seventeen point four minutes, short enough even for a lazy ass like you.

Take the snark down 10 percent, you say, cursing Chris Brigham. And how much will the recipe cost?

*Ten cents*, the fridge says.

After a little back and forth about nutritional content and your excess belly flab and the free recipes available on the Web, you say fuck it and the fridge sends the recipe to your iPhone-ka-ching for Edible Gourmet, ka-ching for the guys behind that talking V, and ka-ching for you, too, since your food is that much less likely to rot in your fridge. And there will be a V on your car, too, on your bathroom mirror, your washing machine, the pump at your gas station, the ATM at your bank. Ask the Coke machine if your son is free for softball on Saturday and the Coke machine will say, Looks like he's finished with his homework but the forecast is rain. Want me to book an appointment at the batting cage? Ka-ching for Joe's Indoor Baseball.

It's the world of seamless convenience, all your desires satisfied with a minimum of fuss.

HE LARGER IMPLICATIONS TAKE A WHILE to sink in. Why

do you need a fancy phone if you can talk to your refrigerator? How much are you going to spend



on an expensive computer when your alarm clock can do your shopping? Just what we need-another hurricane of creative destruction. And Viv will make it easier to talk to machines at a time when machines are getting fiendishly smarter, which could be the biggest problem of all-not because they might become aware and send Terminators after us, although people like Bill Gates and Stephen Hawking are starting to worry about that, but because they might take our jobs. As the technology writer Martin Ford details in an alarming new book called *Rise of the Robots*, there's already a robot pharmacist at the University of California that makes up ten thousand doses of medicine a day, reading the doses off bar codes so that there's never an error. Robot test scorers are more accurate than teachers, even at reading essays. Electronic-discovery services are eating the jobs of lawyers and paralegals. A newswriting program called Narrative Science puts out millions of simple sports and business stories. Online classes are taking on traditional universities, learning to solve their low completion rates with robot tutors. Fast-food robots are learning how to cook a burger, wrap it, and hand it to you—a threat to the jobs of 3.7 million fast-food workers. Robots are even learning to administer cancer treatments, diagnose diseases, and care for the elderly. According to a February report from Business Insider, the market for this mixture of intelligent algorithms and robots is now growing seven times faster than traditional manufacturing robotics, much of it driven by smartphones and tablets

that can control them "at more accessible price points." And Viv will make all of this so much easier, turbocharging new services like Uber and Google's self-driving cars, which will be owned by Google or some other company and go back to a central warehouse for robot servicing, which is bad news for the millions of Americans working at car washes, service stations, taxi companies, and delivery companies.

Futurists like Jeremy Rifkin have been warning about the "end of work" for years, but most people have filed that fear under "Luddite" and assume that capitalism will continue replacing lost jobs. Now some of our smartest economists are starting to ring alarms. Back in 2012, Paul Krugman said there was "no question"

and heath care." Martin Ford cites a recent jobs summit he attended with about fifty tech-company CEOs. "Here in Silicon Valley, there's a remarkable consensus about this. Every single person agreed we're on the leading edge of a disruption, and we're going to have to move to a guaranteed basic income. There was overwhelming support for that."

It seems unfair to lay all this on the gentle geniuses of Viv, who are just trying to give life to their beautiful idea.

"We tell our investors they can take comfort that they're part of the beginning of the end," Brigham jokes.

"I don't think that's what we tell our investors," Cheyer says. "Maybe business kind of gets destroyed in the process," he con-

> cedes. "But they can also get business they never would've gotten-like Match.com could say, 'Hey, it's Friday night and you've both indicated that you like theater. Do you want me to check out the shows on Friday night? Do you want me to get reservations for that restaurant near the theater? Do you want me to have an Uber pick up your date? Do you want flowers sent to the table?' It's new business for everyone."

And Viv solves the discovery problem, making it easier to find the little store or small magazine. It can integrate your loyalties, registering your preference for mom-and-pop stores or couch-surfing in Thailand. My Stuff will actually ask you

questions to make this easy. "I've noticed you ate Mexican food three times this week. Can I infer that you like Mexican foods?" And unlike data-mining

snoops like Facebook and Google, which can tell if you're gay or pregnant even before you admit it to yourself, you can also tell Viv what to forget. "This kind of turns the Google privacy model on its head," Kittlaus says.

And services will be working together in all kinds of new ways. Yummly and Edible Gourmet have recipes, but once they're plugged into Viv they might find somebody asking about the right wine to go with those recipes-and then linking to mapping services and local shops. If old-fashioned things like journalistic ethics were not of concern, Esquire could even harness its product reviews to recommend the best razors or shoes and take a cut on the purchases.

The opportunities are endless, they say. Somebody's got to teach Viv to monitor your refrigerator and order fresh milk. Somebody will build a program that sends out locations and lineups for all the local Little League games. Somebody could build a birdsand-bees tutorial to sidestep the fight over sex education. Law firms can develop their own specialized law-bots. A top cardiologist just suggested a medical noodge to nag you about taking vour medicine and tell the doctor if you forget, which could actually save lives.

And who knows, maybe Viv will even help America's beleaguered musicians. "You can imagine just saying, 'Viv, take my lat-

## **THAT'S THE REAL EXCITEMENT OF VIV, THEY INSIST-THE IDEA OF UNLEASHING THE CREATIVE AND ENTREPRENEURIAL ENERGY OF MILLIONS OF PEOPLE. "WE BELIEVE THIS** WILL BE AS BIG AS THE INTERNET ITSELF," SAYS CHEYER. "IT'S A REVOLUTION."

est track and put it on Twitter, Facebook, and Pinterest,'" Kittlaus says.

But all this wild potential may also be Viv's biggest threat. Established sources like OpenTable will probably dominate restaurant bookings, they concede, and companies like Yelp will have a huge content advantage over new arrivals. Amazon will grow ever mightier. "If you provide a unified interface with no way for people or vendors to differentiate themselves," Gabel says, "economics just tells you at that point it's just a race to the bottom. So we have to preserve branding and personalization. We don't really want this to become like Soviet Russia: 'Buy me the official state car. Get me the official state hotel room."

But the fact is they don't know the answers to many of these questions. They've been working with their heads down, pushing to beat the competition, and they'll just have to worry about all that later.

Anyway, it's not really in their hands. "The world is going to decide what this thing is going to do," Kittlaus says. "That's the novel part of it. We've been building things to inspire people, to show what's possible, but the real question is What's going to happen when we open this up? What are people going to create with it? We don't know."

> IV INVITES THE IMAGINATION, there's no doubt about that. You could sit in your hotel room and ask Siri gloomy questions: "Are you going to put everybody out of a job?"

"I can't answer that," Siri says. "Are you going to put me out of a job?"

"I can't answer that," Siri says. Or you could start a dating service, using that seductively radiating lime-green V to link

up restaurants and florists and lingerie stores! You could have a robot music teacher with in-

finite patience. And how about a satellite-controlled Roomba to cut your damn lawn? Like those big modern combines! And Viv could write the software and run the mowers!

Not exactly, Kittlaus says. You'd still have to connect to the satellite and map out the trees and rocks and write the program to control the machine and build the machine (and handle the liability issues). "Viv's not going to be able to do all the work for you." But Viv would make it a lot easier to put the service out there without a ton of advertising. "Say I want a cheap lawn-mowing service, and because you've got this automated thing, all they do is come once a week and toss this thing in your yard and it just goes about its business. It's going to be pretty cheap."

And once it was in the yard, Viv would be happy to run it. I'm gone a week-have the lawn cut when I get back?

lime delivered? "Absolutely."

"Exactly."

time to figure out."

Steal it fast.



new global brain. And Viv gets "smarter."

that smart machines were rapidly replacing workers in many industries, a trend that had the potential to "turn our society into something unrecogniz-

able." Last year, Larry Summers warned about the "devastating consequences of robots, 3-D printing, [and] artificial intelligence" on both white- and blue-collar jobs. In February, Robert Reich said we were "barreling toward" an economy in which robots do much of the work and most of the profits go to the robots' owners, while humans are reduced to odd jobs like "Uber drivers, Instacart shoppers, and Airbnb hosts." A new study from Jeffrey Sachs and three other prominent economists puts the question so starkly it seems a plot point from dystopian science fiction: "Will smart machines replace humans like the internal combustion engine replaced horses? If so, can putting people out of work, or at least out of good work, also put the economy out of business?"

Sachs's answer? An unqualified yes. His study "firmly predicts" a long-run decline in labor's share of the national income so severe it could crash the economy. "Absent appropriate fiscal policy that redistributes from winners to losers," he concludes, "smart machines can mean long-term misery for all."

Even the libertarians of Silicon Valley are starting to worry. "As much as it pains me to say so," says Jaron Lanier, the polymath behind virtual reality, "we can survive if we only destroy the middle classes of musicians, journalists, and photographers. What is not survivable is the additional destruction of the middle classes in transportation, manufacturing, energy, office work, education,

- "Exactly. And the beauty of it is it plugs your lawn mower into a wider ecosystem-like with the refrigerator, you can say 'Order me some more milk.' "
- So the Roomba lawn mower could have sensors that told you if you needed more lime, connect you to a supplier, and have the
- And John's RoombaMower Co. gets a cut?
- And if its program for satellite guidance is great, RoombaMower Co. can sell the software to every aspiring robo-lawn-mower company in the universe?
- "Absolutely," Kittlaus says.
- RoombaMower will conquer the world!
- "That's actually a really good idea," Kittlaus says. "I think you should quit your job and do it."
- And that's the real excitement of Viv, they insist-the idea of unleashing the creative and entrepreneurial energy of millions of people. They all feel it will be the biggest thing they ever do in their lives. "As a founder," Cheyer says, "I'm allowed to be effusive. We believe this thing will be as big and important as the Internet itself and as mobile itself. It's a revolution."
- They think they're about six months from a beta test and a year from a public launch, hopefully with a two-year head start on their giant competitors. Morgenthaler's optimistic: "They have a new vision and a time-to-market advantage, and the architecture is wholly new. It will take people a considerable amount of
- Kittlaus has been so busy he hasn't even had time to patent a potentially huge new business idea of his own-the lightbulb idea. The lightbulb idea?
- "It's obvious," he says. Because they're everywhere and already have their own power source, lightbulbs will be the most convenient way to talk to machines. Add a microphone and some sweet little algorithm and bingo-it's a billion-dollar product.
  - **N THE MAIN ROOM**, at four long tables, the coders work away, racing toward the public launch. One is working on the user interface, which has to be flexible enough to appear on all kinds of screens. Others are trying to give Viv a better short-term memory, so if you say "three," it will remember whether you're talking about how many children you have or how many there are in your party. This is called "dialogue management," currently a subject of much excitement and research at AI labs across the country. But, of course, the Viv guys don't want to hard-write too [continued on page 130]

## Viv

[continued from page 95] many rules. Once again, the program has to learn to analyze the context, taught by the input of thousands or millions of private developers pursuing the fulfillment of their own desires.

Another group of coders is teaching Viv how to supervise the approval process for new members, which Gabel happily describes as a "very nontraditional thing." The smart machine will actually be testing human contributions to the smart machine.

At his workstation, Cheyer is going through bugs, tweaking to make sure things are centered on the screen and there's no unintentional scrolling. Then he switches to playing the role of the flower-shop owner, teaching Viv to handle customers. *No*, *there's no need to suppress funeral corsages. Yes, ask me whether it's a birthday or a wedding.* 

At his station, Brigham isn't happy with the way that the groups of flower products interact. He wants Theadora's Polka Dot Basket to show up in the centerpiece group more elegantly, with cleaner links to alternatives or a purchase decision. It's another design thing, final touches.

Across the room, Marco Iacono is working on the graphic design, tweaking the appearance for different devices. "This is the iPhone 5—which, you can see, yeah, fits perfectly."

Midmorning, they all gather for a standup meeting, passing a Frisbee around to designate the speaker. "Yesterday I spent a lot of time talking about the developer experience," one says. "I completed the P1's on the automated testing stuff," says another. "I did some cleanup and bulletproofing for WineStein capsule," says a third.

Kittlaus makes a business announcement: "I'm working on getting \$12.5 million wired into our accounts by tomorrow."

The scientists tease him. "What are you gonna do tomorrow?"

"Yeah, how many more millions next week?"

They're all a bit on fire with the potential of it all. "This is the dream project," says Richard Schatzberger, who joined the graphic-design team several months ago. "The technology that these guys here have built is something so radically new and different—it's something new."

"Behind the scenes," as Levy puts it, with the low-key pride shared by everyone at Viv Labs, "there are some pretty nontrivial algorithms."

"It feels awesome," Iacono says. "It's a wild, wild place to be."

For example, lately he's been experimenting with other ways of interacting with Viv.

Other ways? Besides typing or talking? "Um, maybe."

Then he blurts it out: "Touching. We're kind of exploring the edges of possibilities." **B**