# Audio file

[reCAPTCHA and Duolingo Luis von Ahn.mp3](https://1drv.ms/u/s!AMhVeraEIITCz1g)

# [Transcript](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:00:02 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You know, I was feeling good. I I thought, OK, well, we can.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:00:04 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Continue raising money for a while.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:00:07 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[At some point we raise money from Google. Capital G is one of their investment arms.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:00:14 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And partner from that firm sat me down and she said nobody else will invest in this company. If you don't figure out how to make money, you know you're not going to.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:00:22 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Find a bigger.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:00:23 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Fool, we're the biggest fool.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:00:26 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And that's when we that's when we started kind of freaking out and try to figure out.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:00:29 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[How we're?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:00:30 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Going to make money, but we had no.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:00:32 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Idea how we were going to make money.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:00:37 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[From NPR, it's how I built this show about innovators, entrepreneurs, idealists and the stories behind the movements they filmed.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:00:50 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I'm Guy Raz, and on the show today have a perfect storm of skill and luck drove Luis von on to create capture, then recapture, and then Duolingo, a foreign language app valued at $1.5 billion.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:01:09 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Think about the small moments or decisions in your life that actually had a huge impact on how your life turned out.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:01:17 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Maybe it was a conversation you struck up with the person next to you on an airplane. Maybe it was a party you reluctantly went to, only to meet the person you'd eventually marry. Or maybe it was a decision to stay on vacation, an extra day that sparked a new idea for Kevin Systrom. It was a random remark from his girlfriend.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:01:37 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Made them decide to use filters on Instagram.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:01:40 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Them for Blake Mycoskie, it was a chance meeting with a group of young Argentinians who took him to the countryside where he saw kids with no shoes. That one day inspired him to create Tom's and for Louise Fanon it was a free lecture at Carnegie Mellon University. In 2000. We'll get deeper into the story in a few minutes.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:02:00 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[But that single lecture would lead them to invent 2 ingenious new tools. The first was captcha guess Captchas, those annoying, twisted and blurred letters you have to type into a website to prove you're human.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:02:16 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And the second one was Duolingo, now the biggest language learning app in the world, which is now getting even more popular because people are looking for new things to do now that they're stuck at home. Both CAPTCHA and Duolingo were designed to harness the power of crowdsourcing to solve problems, and I'm going to blow your mind.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:02:36 Speaker 3](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Here if you.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:02:36 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Have ever typed in a CAPTCHA or used Duolingo? There's a good chance you've taken part in a massive online collaboration that you probably weren't even aware of, and it's amazing how Louise came up with all this. But let's start at the.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:02:52 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Luis was born in Guatemala in the late 1970s. Both his parents were doctors, and though he was surrounded by poverty and violence in Guatemala City, Louise grew up in comparative privilege and as a kid he spent a lot of time hanging out at the family business.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:03:09 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[My mother's family actually had a candy factory. Everybody is always amazed at the fact that I grew up with a candy factory and, you know, they think that. And it was like Willy Wonka or something. I was not all that much into the candy itself. I was.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:03:23 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Into the machines.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:03:24 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Because basically the candy is made by these gigantic machines that you know pump out. I don't know how many thousands of pieces of candy per hour.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:03:31 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And basically all my weekends I spent playing at the candy factory and I would take the machines apart and put them back together. There would be some extra pieces after I put them back together usually, and that that would.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:03:43 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Be a problem.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:03:44 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Well, what? What kind of student were you and were you was school pretty easy for you?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:03:48 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah, I was pretty nerdy. Basically, I was really good at math. Yeah, math was just easy to me. I you know what I would do during in the summers is basically get either next year's or you.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:03:58 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Couple years later, math books and basically do all the exercises. Wow, it kind of came easy. But the way I really got good at it is by doing hundreds and hundreds of exercises.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:04:07 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[My God, that's what you would do in the summer time.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:04:10 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah, I was born. I mean, I was an only child. Yeah, I this is. I didn't have that much to do. This is remember, this is also pre Internet pre everything So what?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:04:17 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:04:18 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Was I going?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:04:18 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[To do and that's what I did.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:04:20 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I was putting playing cards in the spokes of my bicycle and buying jolly ranchers at 7:11.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:04:27 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Should done math books, so you were. Did you just love math? I mean, was it? It sounds like kids don't think about their future. They're not. Like I'm gonna study math so I can be in tech one day. Like, you must have really enjoyed it.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:04:37 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[No, I did. I enjoyed it. It was. It was like a puzzle for me. By the way, this is not the only thing I did. I.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:04:43 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Mean I also.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:04:44 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Played a lot of video games, pirated video games in my Commodore 64.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:04:48 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Like floppy disks on floppy disks.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:04:51 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Floppy disks? Yeah, that's right. I wanted a Nintendo when I was eight, my mother would not get me Nintendo. She instead got me a computer, a Commodore 64, and I couldn't figure out how to use it. But eventually, I kind of I read like the manual and stuff, and I figured out how to use it.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:05:04 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And then I figured out I could fire other people's video games. And so I became a little hub in my in my little neighborhood. But these were not other kids. These were adults, were kind of basically young adults who had a computer, and they would come to my house, and I would take their games and give them my games in exchange. So I then I collected a pretty large.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:05:25 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Number of video games.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:05:26 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[But but she mentioned right that I mean, because your childhood sounds pretty nice, but but like as a kid, I guess or or even as a teenager, there was a civil war in Guatemala, right? I mean, we know that today there's a a lot of violence there. And obviously there's there's violence in the US and in other countries.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:05:41 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You but Guatemala has been particularly hard hit. I mean, did it feel dangerous when you were a?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:05:47 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Kid. Yes, it did. There was a civil war pretty much since I was born in in 79 to 1996, there was a civil war going on the whole time. It always felt dangerous.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:05:58 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[When I was 15 or so, my aunt was kidnapped for ransom. I mean, she was gone for seven or eight days. People's cars would be stolen.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:06:05 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Wow.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:06:07 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Higher every couple of months, somebody's car would be stolen in my family, going out past 7:30 PM was rare. Yeah, you needed to go out in a large group if you were going to go up at 7:30 PM and you know it. I did have my house had walls and barbed wire, and yeah, it it felt dangerous. I mean, this is one of the. This is one of the reasons I came to the US actually. I mean, I.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:06:27 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You know, when I was after my aunt was kidnapped, I thought to myself, I don't want to.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:06:32 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Live here, yeah.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:06:34 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And and I guess you did end up leaving Guatemala for college because you went to to Duke in North Carolina and you had you described yourself as a, like, a math nerd in school and. And is that what you intended to do like to do something in math?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:06:50 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That's what I wanted to become an A math professor. I I was pretty certain I wanted to become a math professor. You know, at the time, I thought.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:06:58 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[The best thing that I can do is really learn a lot of math and I really loved it and I thought it was futile to learn how to deal with other people. And it is interesting because my job these days is 100% just dealing with other people and people.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:07:12 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

['S problems, but I'm just trying to understand this so so by becoming a math professor, you thought, hey, I wouldn't have to deal with people.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:07:18 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Just deal with like facts and data and numbers.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:07:21 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yes, yes. And you know, I'll do math research all day long and every now and then I'll teach a class. But whatever, that's.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:07:27 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Tax. That's just what I thought.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:07:29 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So all right, so you are, so you get your degree and you're following this path to go into academia and you go.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:07:35 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[To a PhD program at Carnegie Mellon. Correct. And I guess you go into computer science.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:07:40 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Right. Yes, I changed from math to computer science because I visited a math grad school and what people were saying the professor was saying. Ohh, I'm working on this open problem that nobody's been able to solve for the last 300 years.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:07:54 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And I thought, I don't think I'm smart enough. I mean, if you haven't done it and nobody's done it in 300 years, that's kind of enough for me. Whereas when you visiting computer science, I mean, this is crazy thing. People are like, oh, yeah, I solved an open problem yesterday. Wow. It's a much younger field. Yeah. And so that I thought that was much more exciting for me at least.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:08:10 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So you are you started as year 2000, you start your PhD program at Carnegie Mellon and I guess like really soon after you start you go to some talk by someone from Yahoo comes to campus to talk about Yahoo. Yahoo was a big deal in 2000. Who is that? What's the?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:08:28 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Right. Yeah, that was serendipity. Again, most of most of the things that have happened in my life are serendipitous. I was a first year PhD student. I had been at Carnegie Mellon for maybe two months. I had, you know, the first thing you got to do when you become a PhD student is find an advisor. I have found myself an advisor, and we went to talk together. This guy from Yahoo, who was the chief scientist of Yahoo.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:08:48 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[At the time and and like you said, Yahoo at the time was the, you know, the biggest tech company out there. And he came to give a talk at Carnegie Mellon and it was the talk was basically 10 problems that they didn't know how to solve at Yahoo. And I was an enterprising PhD student, and I thought, I'm going to try.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:09:04 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[To solve these problems and what was the problem that he said they had?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:09:07 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah, so the problem for this particular one was there were people who were writing programs to obtain millions of free e-mail accounts. So Yahoo at the time gave out e-mail accounts for free. And some people thought it would be good to send spam from Yahoo accounts. The problem is each Yahoo account only allowed you to send like 500 messages.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:09:19 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:09:28 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So if you want to send 10 million spam messages per day, you just have to get a bunch of Yahoo accounts and from each one of them you send.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:09:36 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[500 messages and this is the era. And remember this. And we all remember this where you would get hundreds of messages, spam messages about certain bodily enhancements. You would guess messages.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:09:48 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[About the hormone growth things, I mean baldness. I mean, it was. It was the emblem. Canadian. Yes. Right. Yeah. Yeah, just spam. It was a huge problem. And he was like, we can't.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:09:48 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yes.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:09:53 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Canadian pharmacies selling you Viagra.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:09:56 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:10:00 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[But how to stop these computers or or or programmers from making you know just creating all these e-mail accounts?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:10:08 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah. And so that was that.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:10:09 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Was the problem.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:10:10 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And just to be clear, these spammers were not physically setting up each individual e-mail account.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:10:16 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[No, they had written programs that would just set up millions of e-mail accounts a day or however many.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:10:21 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Per day. So I thought about it for for weeks and months, and I talked about it with my PhD advisor Manuel, and together we came up with the solution.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:10:30 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Which?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:10:30 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Was the thinking here is look computer programs can get a million e-mail accounts per day because, well, computer program can do things very fast and it also doesn't get bored, right? Humans humans can't get very many e-mail accounts.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:10:43 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So how about this? How about if we make sure that whatever is getting an e-mail account is actually a human and.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:10:49 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Not a computer program.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:10:50 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Then we started thinking, OK, well, how can we distinguish between the human and the computer? Yeah. And that's where this this idea came came about. It's this idea of a capture where it's basically these distorted characters that you have to type whenever you're buying tickets on Ticketmaster or getting in, you know, an e-mail account or stuff like that. The idea is that a computer.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:11:11 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Can generate one of these you know. Basically take some letters, put them in an image, distort them, and then you can give them out. And it turns out that humans can read these well at the time humans could read these very well, they still can, but computers could.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:11:26 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[By the way, I can't read them. I'm the human that can't read them.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:11:26 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:11:29 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I can't just.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:11:29 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Well, I don't know. I don't know how much.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:11:31 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Of a human you are.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:11:32 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Now they're like point to every stop sign.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:11:34 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Point to every.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:11:35 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Bridge. Yeah, yeah.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:11:35 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah, yes, it's changed. But basically at the time, the idea was humans can read these distorted characters much better than computers. So let's give basically every time that somebody's trying to get an e-mail account, let's give them a test.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:11:46 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[To see if they're human or not, and you just start doing this on your own. Like, did you tell Yahoo? Did you tell him or or were you just like this?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:11:53 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Is fun. I wanna figure this out like.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:11:55 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Which is working independently.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:11:57 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah, I mean, with my PhD advisor, it was, it was. It became my research. It became my research subject. And yeah, we did.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:12:03 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Not tell Yahoo because it sounds like here's the kid getting the math mathematics workbooks in the summer. It's like you just seem like a fun.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:12:12 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Thing to solve.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:12:13 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah, it was fun. And, but that's like the that's the core of the PhD program. I think, you know, you're you're trying to find problems that that others haven't solved and you're this seems like a problem that other people haven't solved. So we we were.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:12:20 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I got you, OK.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:12:25 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Working on it and you called it CAPTCHA. Did you name it captcha and what does that?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:12:29 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It's an acronym. It stands for. Yeah. Yes, it's an acronym that sounds like capture, which, you know, the idea was to capture the, you know, the bot or, yeah, the computer burn. It stands for completely automated public Turing test to tell computers and humans apart. So you know, it's just an acronym. But but now. And I think most people have heard of the word capture.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:12:30 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Sounds like capture to like to capture.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:12:33 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[But that's not what it is.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:12:49 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So do not know what it stands for.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:12:51 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And you come up with this thing Captcha and what do you do? Do you like e-mail, this guy Yahoo and say, hey, I've got your solution for.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:12:57 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You basically, I mean, we emailed him and we said, hey, you know, we think we have a solution. Here's some code, you know, and we explain how it works and what what's amazing. And now that I know how large companies operate and how how slow things move, what was amazing is within about a week of when we sent them this, it was already functional, you know, life.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:13:15 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Wow.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:13:17 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It was life, so I guess the problem that they had was so big that when they saw this, they.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:13:22 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Were like, OK, let's let's do it now.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:13:23 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Wow. So they saw this and like, Oh my God, this is great. And so you must have just, I mean, you were like, what, 2526?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:13:29 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[20212121.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:13:32 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Oh my God. See you. Right. See all of a sudden you're an overnight millionaire multi millionaire.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:13:32 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Uh-huh.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:13:36 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[No, no, no, no, no, no, no. Money was no money exchanged hands.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:13:40 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Dear wait, you gave caption to them. You just said hey here.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:13:43 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You go. Yep. I mean, listen, this is.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:13:46 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You gave it to a multi billion dollar company, just gave them captcha.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:13:50 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I didn't know how things work and you know the truth of the matter is, it's probably a good thing in retrospect. I mean, who knows what would have happened? But I, you know, I I don't have regrets, but yes, that was that's what started happening. And and then basically every other website started, you know, they saw that it was in the in the front page of every other web.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:14:08 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So I started copying or making their own version and within a couple of years.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:14:10](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Right.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:14:13 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Pretty much everywhere on the web. You know when you had to get an e-mail account when you had to enter?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:14:16 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[A comment on.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:14:17 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[A on a blog when you where you had to buy tickets on Ticketmaster, you had.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:14:18](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:14:22 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[To enter 1.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:14:22 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Of these, you were the guy. You were the guy who made it really hard for dopes like me to get it right. I had to.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:14:29 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Constantly, yeah, yeah.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:14:29 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It was annoying. It was annoying to people and every time that I would be at a party or something and you know, they would ask me what I did and then they would get me to explain my research. I would, I would explain that I had done that. And would you know.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:14:39 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:14:39 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Say.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:14:40 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[What the hell? You know? So screw you. Screw you.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:14:41 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[They'll kick you at the party.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:14:44 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[But but some of the research you did, I mean you, you did actually write some software that you sold for, I think for some money this time, just like, could just briefly explain how that happened and what you were working on.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:14:52 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:14:57 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah, I mean, this is, it's funny. I mean, at the time this was not called crowdsourcing, but my PhD research was basically on crowdsourcing. I had worked on capture where the idea was that humans can do some things computers cannot. Yeah. So my PhD research was basically that finding things that computers could not yet do, and then finding ways to get people to do them and in particular.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:15:17 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[The main thing that I did in that time was a game and people loved to play it, but as they were playing it, they were actually helping computers figure out what's inside an image.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:15:28 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[How did the game?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:15:29 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Work the way the game work was this you went to a website and you got randomly paired with somebody else who had shown up to the website. Got it and you were both shown the same image.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:15:38 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[An any image a random edge like an elephant.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:15:40 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[An image from the Internet? Yes. And you were told type whatever the other person's typing, just start typing words and if you are one of your words matches one of their words.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:15:49 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You both get points got.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:15:50 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It what? What's interesting about this game is that the words that people typed.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:15:56 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[The only thing they had in common was the image, so the words that people typed were basically related to the image, because if you're told to do this, what are you going to type? If it's a picture of an elephant, you're gonna type elephant cause you think the other person is also typing elephant. So those words were really good labels for them. And we really good tags for the image basically. So I put it online. I programmed that millions of people played it.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:16:06](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Sure.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:16:16 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[This was a game that was helping label all images on the web and at some point actually.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:16:23 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Google in fact bought it. They just bought the technology and then it got it got implemented. They changed the name from the ESP game, which I call it the ESP game, because it's extrasensory perception. The idea was like trying to think what the other person was thinking to the very amazing name of the Google image Labeler, which is much less interesting.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:16:42 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And and so they bought this.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:16:44 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[From you and was that like life changing money? I mean, were you all of a sudden super rich?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:16:49 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[No, it was not super rich, but it was.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:16:51 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It was good.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:16:51 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Got it. OK. So you you went on to earn your PhD and and you get a job at Carnegie?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:16:57 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Mellon, correct.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:16:58 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You're a young professor. You're you're on tenure track. And by the way, early on in your academic career, I should mention this. You were granted a very, like, one of the most prestigious awards the MacArthur grant, known as the Genius Grant. Basically, they pick a few people a year and give them, like, half, $1,000,000 of unrestricted.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:17:18 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Money.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:17:19 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Work on on whatever they want. I mean, it must have been mind blowing.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:17:23 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah, that that was. You know, I've I've gotten a number of awards in in my life, but I mean, that was a particular that was probably the most impactful one in sense of just how I felt. And also they do this crazy thing where they, you, you have no idea that you're being considered or anything and they.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:17:31 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:17:39 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[They call you randomly? Yeah, they figure out your phone number one day. You pick up and then they just tell.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:17:44 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You, you know, have you ever heard of the MacArthur Fellowship? And, you know, you say yes, and then they just tell you and you're like, wow, like, what the hell, first you think it's a prank? I.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:17:53 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Thought it was a prank. Yeah, and I guess, like, around this time, too. I don't know if this is apocryphal or not, but.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:17:59 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I read that.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:18:01 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Bill Gates personally called you to try to convince you to leave.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:18:06 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Your job at Carnegie.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:18:07 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Plan and to go work for Microsoft. Is that true?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:18:11 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That that is true that.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:18:12 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Like, what did you pick up?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:18:13 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Your cell phone. It's like, please hold for Mr. Gates or was like he wanna live.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:18:18 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It was pretty much like that. It was pretty much like that. I mean, it was somebody, you know, basically said that please hold for Mr. Gates.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:18:24 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And you were like, OK, and he gets on the phone. And he's like, Louise, it's Bill Gates here.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:18:31 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That's exactly right. I have been an intern. I have been like a year and a half. Before that I had been an intern at Microsoft and so I had good ties with Microsoft when they really wanted to hire me for Microsoft Research. And so that is, you know, Bill Gates spent there, I don't know, 45 minutes to an hour trying to convince me to go there. I was very flattered. But, you know, at the time, I just wanted to do my own thing, be a be a professor.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:18:51 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[How do you say no to Bill Gates? What you were like. Ohh, wow. Thank Mr. Gates. Really pretty. So nice and so honored. But I just you know.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:18:58 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[No, I didn't actually say no. I said I would think about it and then and then I.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:19:00](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[OK.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:19:02 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Said no to like a recruiter.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:19:04 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[But yeah, it it was not easy. I mean, he's a major hero of mine. I mean, he's he's he's just an amazing human being. But I just wanted to be a professor at the time I thought I want to do my own thing.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:19:14 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I want to be a professor and that that's that's what I wanted to do. Yeah, was.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:19:17 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Money important to you? I mean, you know, was it important to you? It matter. And it interestingly, I guess it mattered more than it does now.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:19:24 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It's nice to know that I, you know, I could. I could buy a nicer car or get a nicer apartment or something. This was nice, but it wasn't. It's never been my driving force, I would say.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:19:33 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[OK, so you decide I'm not Bill Gates. Thank you. No, thanks. I'm not going to Microsoft. I'm going to stay doing this work. So you are now. Were you lecturing? Were you teaching classes?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:19:43 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I was teaching, I was teaching a huge class. It was called great theoretical ideas. In computer science. It's just a fancy name. It's basically a a discrete math class, right? People who don't do well there.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:19:54 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Usually change majors.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:19:55 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And and you're like, not like John Nash. But I'm thinking about that movie you're in front of a a like a big blackboard or a whiteboard and doing equations and problems in front of 250 kids.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:20:04 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah, slides had already been around, so I I used, I used PowerPoint, I used PowerPoint.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:20:06 Speaker 4](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[OK.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:20:08 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[OK.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:20:09 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I'm not that old, right? Yeah, yeah, yeah. You're right.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:20:12 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[OK, so you're teaching and you had done captcha and lots of people are saying hey.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:20:17 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It's annoying and you're like, Yep, I hear you. And and people kept saying that to you. Like you kept hearing.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:20:23 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That. Yep, Yep. And and that's that's when I started thinking each time you do it, you waste about 10 seconds of your time. And I just started this thought just came to me of wow. How much time am I wasting of human?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:20:35 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Ready. And you know, I did a little back of the envelope calculation and realized about 200 million \* a day. Somebody types a capture and that's when you get 200 million \* a day times 10 seconds. So humanity as a whole is wasting about $500,000 a day typing these captions and and that's when.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:20:50 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I started thinking.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:20:52 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Related to you know all my research that I have done.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:20:56 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Is there something we can get humans to do while they're typing a captcha that is also useful and we got them to do something useful? And it occurred to me that yeah, we could get them to help digitize books and.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:21:02](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yep.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:21:07 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[How did sorry pause. How did you come to that?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:21:10 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah. So like when you type in a random random letters from a captcha, you were thinking, wait, how do we have a secondary use for this? And maybe it's books, digitizing books. How did you even, how did that even occurred to?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:21:20 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yes.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:21:23 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You I I was thinking for a long time. Can we get people to do something? But at the same time kind of extract valuable computational.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:21:30 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Effort from it until it finally occurred to me. Oh.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:21:34 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[There's all these projects out there trying to digitize all the world's books. Google had announced a really yeah, at the time. It's kind of an insane and ambitious project that we're going to take all of the world's book, everything that's ever been written is 100 million books ever written, and we'll put them online. This is what we're going to do. And now in this process, the way the process works is you take a book, a physical.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:21:49 Speaker 3](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:21:54 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Then you scan every page.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:21:57 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And then the computer needs to be able to decipher all of the words in those photographs. Now the problem is that computers cannot at the time could not recognize many of the words. About 30% of the words computers could not recognize, and the reason for that, by the way, which is this amazing thing, is the same reason why computers could not read Captchas. Basically, this looked kind of like distorted.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:22:17 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Letters and.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:22:18 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And distorted letters are just inherently difficult for computers to recognize, like that's the point of CAPTCHA.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:22:22 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah, that's right. And so it it occurred to me. Oh well.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:22:27 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[What if we just take the words out of a book that the computer could not read, and then we send them to people while they're typing captures on the Internet. So basically, next time you type A, capture the words that you see are actually coming from a book, and whatever you enter is in.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:22:39 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Fact used to help digitize a book.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:22:41 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Do you remember when you came upon that idea? Was it? Was it like in a flash, or was it just, like, did it occur to you like?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:22:47 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I do remember I was. I was driving from Washington, DC back to Pittsburgh because I had been to some National Science Foundation.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:22:55 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Panel or something like that. Then I spent the next, you know, few weeks, just kind of going over it and over going over it and.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:23:00 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I thought, OK this this will work.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:23:03 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And you know, I started building the system, but then I I recruited a guy who was. His name is Ben Moore. He was maybe a freshman in computer science at Carnegie Mellon. He was one of my students. He was in my class in my large class. He was the best student and.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:23:18 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:23:18 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Thought you you can help me.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:23:20 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Build this and so together we built this system that would take a scan of a book and extract all the words the computer could not recognize and then send them as a capture. Now we decided we're going to go to big websites and we're going to tell them, hey, look, we have this capture service, it's free, it's better than yours. Yours is relatively crappy.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:23:40 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[This one's pretty good and we'll give it to you for free, but all we have to be able to do is see what your users can type our typing during this so that we.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:23:48 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Get to digitize the books and did websites start like start to use this tool?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:23:53 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You know, some small websites started using it. The first largest. It wasn't even large. The the largest website for a while.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:24:00 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That was using US what's called online \*\*\*\*\* \*\*\*\*, and they were to get an account in online \*\*\*\*\* \*\*\*\* you had to.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:24:03 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Nice.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:24:09 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You had to type a capture and it was our CAPTCHA, and every time every person that was getting an account in online \*\*\*\*\* \*\*\*\* was starting to help digitize steps.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:24:17 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[God bless them.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:24:19 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[God bless them indeed, and at some point a website that was relatively new at the time decided they needed to put a captcha on their on their registration flow and they called us up and it was it was a a website calledfacebook.com.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:24:34 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And they they were relatively new and they were like, hey, listen, you know, we we saw that we came across it. It seems like you have a good capture and we you know can we put it up probably 2006 thousand. Yeah. You know we said OK cool and they did it and that website was growing very fast and so pretty soon we just had a.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:24:42 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[This in 2007.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:24:54 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Ton of people using our thing and then.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:24:57 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[At some point I was giving a talk somewhere in Dallas about this system and how we could digitize books etcetera. And the guy who was the CTO of the New York Times was in the talk and he said to me, hey, you know what we have this archive of 130 years of content from the New York Times that we have not been able to digitize, particularly because computers cannot recognize.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:25:16 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Is the words. How about you digitize it for?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:25:19 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Us and I'm just just out of curiosity. Eventually I'm. I'm assuming you thought this could make.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:25:24 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Money, we thought.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:25:25 Speaker 5](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[OK.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:25:25 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[We thought, but we really didn't. It was we kind of thought we could make money, but we didn't know how. And what happened is this guy, you know, he didn't. He sent me an e-mail. He said no, I was.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:25:33 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Serious. Let's do it. How much would you charge me to do this?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:25:36 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Charge them to do what? To digitize the new, old New York Times.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:25:37 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So to help digitize their content.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:25:40 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[The the entirety of the New York Times.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:25:43 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And so, you know, we kind of scramble and we we had no idea how much to charge them and then we just thought to ourselves, OK, how much would this person have to pay people to digitize? Because the only.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:25:52 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Other.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:25:52 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Solution is people. Yeah. So we came up with something. We said, OK, divide that by four. Yeah. And that's what we're what we're charge. And we keep the number we came up with was for every.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:26:01 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Year of content.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:26:02 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[We will charge you $42,000.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:26:05 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[For every year of content in the times, OK.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:26:08 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yes, over every if you take one year, all editions of that year we'll charge $42,000 to digitize.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:26:12](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:26:13 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That whole thing, that's the number we came up with. And then they they.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:26:17 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Said yes, and how many years of that's like 100 and 2030.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:26:20 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Years of yeah, several $1,000,000 of a contract there. But they said, OK, we pay per year, let's do it one year, then another year, then let's let's see what happens. And so they sent us the first year we did it and it turns out because Facebook was already using our capture, we actually were digitizing relatively fast it was.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:26:35 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Like how quickly would it take to digitize?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:26:37 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[A year of a year. What's being done in about?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:26:40 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[A week, what a week of people typing in Captchas could digitize a whole year of the new.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:26:46 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Times yes. So that's that's what was going on.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:26:49 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I'm just here's here's a question right? Which is say I'm I was getting on Facebook in 2000. This is like 2008. I think when the times approaches you right. Yeah. Yeah. So I'm on Facebook in 2008 and I I sign up for it and I got to write a captcha and the word that I've got a decipher is.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:27:07 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Anxiety and one of my favorite words, and I type that in. But how do you know? How does capture know that I did that accurately?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:27:16 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That's a very good question. So what happens is for you, we actually give you 2 words. We give you, 1 is the word anxiety. It's a new word that we just got out of whatever the New York Times. And then the other word is a word that we.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:27:28 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[We already have digitized. We already know what the answer is for the other word and then we don't tell you which ones which.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:27:32 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[We just tell.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:27:33 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You please type both. Yeah. And if you type the correct word for the one for which we already know the answer, we assume you're a human.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:27:39 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And then we also get some confidence that you typed the.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:27:41 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Other word correctly.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:27:42 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Got it. And if we give this new word to like 10 different people and they all type the same, you know, the same word. They all type anxiety, then we agree, then we.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:27:50 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Then you know it's right. OK, so your accuracy was pretty high.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:27:52 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Know it's right.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:27:55 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Very high, yeah.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:27:56 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Wow, so so within a week?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:27:58 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Or so you get this first year.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:28:00 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Of the New York Times, digitized and then presumably they're like, OK, let's keep going.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:28:04 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That's right. And So what started happening is they started sending us checks for $42,000 coming in pretty quickly and and by the way, we had no company. We had nothing. And at some point Carnegie Mellon got win.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:28:10 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Nice.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:28:15 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Of this, and they're like, wait a second. You're kind of running a company here, but not really because there's not even a company like.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:28:15 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:28:21 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You gotta get.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:28:21 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Out of here? Yeah, they had a standard deal that says, OK, if you're going to start a company based on on something that you came up in your research, we'll take 5% of this company and. And so that's what happened. So we just said, OK, how about you keep 5%, we'll start a company.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:28:35 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And so we did. We started a company, I got a lawyer, we formed a company and pretty soon we were making, you know, $42,000 every few days.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:28:41 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Insane and and did you call it recapture?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:28:44 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It was recaptcha Inc yes.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:28:45 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And did you leave Carnegie?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:28:47 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Mellon. Or did you stay on as?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:28:48 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It OK love this.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:28:48 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[No, I stayed as a professor. This was a really a side hustle. Everybody. I stayed as a professor. Ben, who was also working on it, stayed as an undergrad. He was like by then he was like a sophomore. He say he just stayed as an undergrad. I stayed as a professor. Was the side hustle, but it was making quite a bit of money.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:29:02 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[For for us not doing all that.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:29:03 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Much in there, it's incredible. I mean, you basically have a.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:29:07 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Hustle, where all of the work is being done for you by people who aren't, don't even know and wouldn't really care because it takes them two seconds and they're getting a free Facebook account meantime.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:29:18 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[They're digitizing the times and you're getting $42,000 checks every couple of days from.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:29:24 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[The times. Yep.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:29:26 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That was the that's what we're going on.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:29:27 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It's just, it's like one of the most genius businesses ever. Like I can we can you. We talk after this interview is over to figure out a a thing like this. This is amazing. You don't.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:29:38](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah, that.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:29:38 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You don't have any employees. This is incredible.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:29:41 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah, it was it. It was pretty good. But then you know that that went on for for some time and then actually Google in fact bought it for their own book digitization process. Umm.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:29:50 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Hold on. They approached you. They saw this and they saw that this was really. And they and they said to you, hey, we can use this for our books digitization and and what they like threw a number on.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:30:02 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[The table? Yes, I mean multiple numbers were throwing them out and in the end we we decided this was a good home for it. So we.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:30:05 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:30:10 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You know, sold it to Google and this time I did go to Google for two years, so I took a leave off of being a professor.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:30:18 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[OK, so you were running this company, this small business. Google buys it from you, which is just incredible.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:30:26 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You're still at this point, really young. This is really life changing.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:30:30 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yes, especially since we didn't have, we didn't have investors or anything. It's all the money went to us.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:30:35 Speaker 3](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And your.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:30:35 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Their startup costs were relatively low.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:30:37 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Oh yeah. Wow.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:30:38 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Alright, so you got acquired by Google. You are still a professor at Carnegie Mellon in Pittsburgh, but but you went to California to Silicon Valley to to go work at Google?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:30:49 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Google happens to have an office here in Pittsburgh, and so I was spending about half time here in Pittsburgh and half time in California.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:30:52 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Ah, OK, great.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:30:56 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And what were you doing at Google? Were you still just basically running recapture?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:30:59 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Well, the first order of business was to integrate recapture into the Google infrastructure that took about a year. But I was still a professor.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:31:07 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And even though I was on leave, I still had PhD students and towards the end of that first year I started getting very, very interested in the the project, which happened to turn into Duolingo.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:31:18 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And, and I'm. Presumably Louise, I mean, given that you've already turned on Microsoft like four years earlier.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:31:23 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Where you were not going to become a Googlers, you you really. And this is part of the deal you had to go work with Google make.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:31:27 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[No, I wasn't.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:31:30 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Happen, but it sounds to me like you're so restless. You you were not gonna just work in a big.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:31:35 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Organization for this year.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:31:36 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I wasn't gonna do that. Yeah, I it's not. It's not my thing. I mean, I I I kind of have to do my.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:31:41 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Own thing. What do you think the reason?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:31:44 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[For that is.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:31:45 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I don't know. I mean I, you know, I probably because I'm an only.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:31:48 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Child, I don't know. I just just restless.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:31:51 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I'm I'm restless and I'm also obsessive. I obsess on one thing and this is this is what happened with Google. In the end. I mean, I was starting to get obsessed on this new project, Duolingo, and this I I just had to leave. And and by the way, leaving cost me quite a bit of money because some of the recapture.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:32:05 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Payment required that I stay there for three years. Yeah, and I did not stay.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:32:09 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[For three years. Hmm. So so you had to give up some of the money, but so in the meantime, you're still.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:32:15 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[At Carnegie Mellon teaching, and I guess you got a graduate student there who would eventually become your co-founder at Duolingo, and I think his name is Severin. Hacker is that?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:32:17 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[M.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:32:28 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Right. Severin hacker. Last name is Hacker.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:32:31 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I mean, it's like a movie name. His name is Severin Hacker.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:32:34 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And by the way, the way I.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:32:35 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I met him. I was literally sitting in my office one day, minding my own business, and then this lanky guy shows up super tall and super skinny and he says hi. I'm 7 hacker and I just said what they didn't parse it, and then he just did hand gestures 7. He did a gesture that is like.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:32:55 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Basically cutting his arm. Yeah, as if he was severing it. Yeah. And then hacker, he just did like, as if he was, like, moving his fingers, like typing with the computer. And then I'm like, Ohh Severin hacker. Wow. And he said, yeah, I'm here and I I would like to do research with you. Kind of.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:33:01 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Alright, keyboard, my God.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:33:09 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Work with you and.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:33:10 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I said yeah, sure. Your name is so amazing. I'll do it.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:33:15 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[When we come back in just a moment, Heloise. And yes, Severin Hacker, take the recapture business model and try to use it again to teach people foreign languages or free and how they discover that particular model is just not going to work. Stay with us. I'm Guy Raz and you're listening to how I built this.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:33:36 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[From NPR.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:33:48 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Support for NPR and the following message comes from our 2020 how I built this lead sponsor, Comcast Business. Dave Silver is a co-founder of Rec, a space for creatives. Dave reflects on why the REC founders chose Comcast business to help power their studios.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:34:05 Speaker 3](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And workspaces we could have hundreds of creators in our space. We could have 14 studios book recording music uploading to the cloud. Comcast Business helped us to.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:34:17 Speaker 3](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Provide the experience that we were looking to provide to our Members.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:34:21 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Learnmore@comcastbusiness.com Comcast business beyond fast.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:34:27 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Thanks also to stand for small and American Express stand for small.com is your one stop shop for resources, offers and tools to help your small business get back to business. Visit standforsmall.com.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:34:45 Speaker 4](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Let's all close our eyes. Take a deep breath, let it out, and listen to NPR's all songs considered. It's a music podcast, but it's also a good friend and guide to find Joy and troubled times. Hear all songs considered with new episodes every Tuesday and Friday. Wherever you listen to podcasts.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:35:06 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Hey, welcome back to how I built this from NPR. I'm Guy Raz. So it's around 2012, and Luis has been working at Google for two years, and he's got one more year to go to get fully paid out. But he's itching to get going on his next project. So he walks away from Google early.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:35:26 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Interestingly, what motivates me started changing quite a bit after the recapture acquisition because I really thought, OK, I'm in a really fortunate position in my life. I now you know, I don't particularly need to worry about money. Can I do something that helps people? And so I really started thinking about education.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:35:44 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And several, unfortunately, it was also very much into education. So we started thinking, can we do something with education that gives it away for free and and the thinking really was there's all these people that I grew up with in Guatemala, very poor and a lot of people talk about education as something that brings equality to different social classes. But I always thought as the opposite, something that brings inequality, because what happened, at least.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:36:05 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You know in my case.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:36:06 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Those who have money can buy themselves the best education.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:36:08 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[In the world and those who don't barely learn how to.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:36:12 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Read and write.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:36:12 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[But you're thinking along the lines of like, what is something that can be free, but that would kind of be self generating. So for example, many business models offer a free service with advertising. That's Facebook's model. That's Google's model. They they capture your data, which you get this service in return. But you were thinking.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:36:27 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Mm-hmm. Yep.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:36:32 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[How can I create something that doesn't cost people anything, but that can be sustainable?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:36:38 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That's that's what I was thinking. I was thinking, can we make it sustainable and can we make it free and languages in particular changed? I mean, Duolingo is a way to learn languages. We we ended up going to languages particularly also because in both of our cases, we're not native English speakers and.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:36:53 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Seven. It was not either.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:36:55 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[No, he's a he's a he's. He's from Switzerland. He's a Swiss, German, native speaker. And so in both of our cases, learning English completely changed our lives.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:36:55 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Where is he from?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:37:05 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And I just knew, you know, when I was growing up, everybody in Guatemala wants to learn English. Nobody could afford it. And turns out that in most countries in the world, if you know English, you can double your income potential. So we thought, OK, can we figure out a way to teach people language in particular, teach you English in a way that's that's free and but also self-sustaining.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:37:25 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[How can we make it so that it kind of pays for itself?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:37:28 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[OK, so you've got this language. You think language is where it's going to be at because that's that's how we can actually help people.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:37:35 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Increase their income, for example, especially in other countries, umm. And then the next.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:37:39 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Question is OK what does that?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:37:41 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[What does that thing look like?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:37:43 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yep, that's what we were thinking. And then eventually we came up with this idea, which is pretty similar to recapture turns out today, Duolingo does not work this way. It is a good idea, but it is a relatively impractical idea.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:37:57 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[What? So what was?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:37:57 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It so the idea was this. We're going to give the service entirely for free, but instead of having people pay us.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:38:03 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[We're going to get them to help us translate stuff, so look, there are all these companies that want to translate stuff. For example, CNN would like to translate all their news that they publish from English to Spanish. They're currently paying people to do that translation. We thought, OK, what if we get these people who are learning English on our platform?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:38:23 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[What if, as a part of their way to practice, you know that after they learn some stuff we tell, we tell them? Hey, here's the CNN article, can you translate it? It's in English, you're learning English. Can you translate it into Spanish? And then if we get multiple people to translate the same thing and they kind of collaborate with each other to make a translation at the end, we'll.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:38:42 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[We'll get a translation and we thought, OK, we could sell that translation back to somebody like CNN and make money that.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:38:49 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Way and and you would use the same technique as used with recapture. Like if 10 people got that the same exact sentence you knew was right.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:38:57 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I had to be a little smarter than that. It turns out if you give a sentence to 10 people, they'll all translate it differently. Like generally, yes, I mean we we would use, you know, kind of they had to be pretty close to each other. Then we also had another step where and the exercise to the person wasn't translate this, but tell us whether this translation is right or wrong. Right. So some people would would check the translations.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:39:02 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[OK. Yeah, right.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:39:17 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[But in the end, we built the system. Actually that worked pretty well that basically you could give it a text.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:39:23 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[English there were people who were learning English or who could be learning English, and then they would be they would help translate it and then the system would pop out, a translation that was made by people. And the translation was.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:39:35 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Very good. It's.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:39:36 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Instead of CNN paying some translation service, they would just pay you and you can.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:39:43 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Like the New York Times has said.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:39:45](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[40.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:39:45 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That's our choice. They you would just have your students learning a language, but they would also be translating these articles into their native language.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:39:52 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That's exactly what the idea was.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:39:54 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So OK, so you have this really great idea by the way, and I'm assuming you're funding the whole project right because?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:40:01 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah, it was a Carnegie Mellon project and it was being funded by a grant from the National Science Foundation.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:40:06 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And also from my MacArthur grant at Carnegie Mellon and funding at the time, what it meant is basically paying for severance salary.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:40:09 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[OK.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:40:13 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah. Yeah. And so, at what point did you say the Severin? Alright, let's spin this out and start a business and.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:40:20 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And uh figure out who you know.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:40:22 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[This was also an interesting thing. I'm we we OK? We thought, OK, we're let's do this. This is a good idea. We're convinced it's a good idea. Let's do this. But the first thing we do is hire more people because the two of us just can't do it.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:40:33 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So we started hiring people, but all inside Carnegie Mellon, we realized actually hiring people was pretty expensive inside our university. And then we thought, OK, well, what I need to do is apply for a bigger grant from a national National Science fund.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:40:46 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And I started working on that and these these grant applications is like 30 pages long and you have to wait like a year to hear whether you get it or not. And it's like a couple $1,000,000 maybe. And so I was working on that. And then suddenly I got connected to a venture capital firm, Union Square.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:41:05 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Centers and you know, I talked to them about this and very quickly they get back to me and they're like.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:41:12 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[OK. We could fund this. I didn't have to write 30 pages. It was.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:41:17 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Much easier to pick up money, so we thought, OK, well.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:41:19 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[They they wanted to just they wanted in.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:41:21 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[On this because, well.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:41:22 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[First of all, you had a track record of.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:41:24 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It was mainly the track record. In retrospect, you know, I know I'm have a relatively good relationship, like close relationship with the Union Square folks. I mean, they've now told me, look, we've never thought this would work, but you had a really good track record, so why not?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:41:36 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[They want to invest in you, right? So when?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:41:38 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[They they approach.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:41:38 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You, they said. We want to fund this, we want to invest in this and at this point you had not dealt with an outside.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:41:43 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Investors in your career?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:41:45 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[We had not, and also this this was still not a company. So at that time we just thought, OK, well, let's make it a company.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:41:51 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And let's take some funding.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:41:53 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah. And how did you do that? Did you was there? I mean, 7 was your student. So was there an uncomfortable conversation or was it pretty clear? You're like, listen, that was my idea. I'm the boss. So I'm going to have X percentage and.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:42:03 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You know, Severn is just, I think it's partly because he's Swiss or because he's like a computer. He's like Mr. Spock.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:42:11 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[He had that conversation with me. I didn't have it. He sat down and he said I want us to write a contract, but it's not a lawyer contract. I just want to write basically a a Word document that we write few lines long that just basically says what our understanding is.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:42:28 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And we're both going.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:42:29 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[To sign it.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:42:30 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And we wrote down a contract that was just really simple. It's like we'll go in at half and half. Yep. And all decisions related to hiring, we're going to do together, all decisions related to. I don't even remember what else. But there's like 3 or 4 bullet points. And then it just said his name and my name and we signed it. And that was it.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:42:49 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So alright, you create a company and you've got some interested investors and I think you raised like 3 + 1,000,000 dollars from a bunch of different investors.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:42:59 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Right. There's 3.3 million, which at the time this was a normal Series A. So it's $3,000,000 from Union Square ventures and 300,000 from a combination of Tim Ferris.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:43:10 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And Ashton Kutcher.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:43:12 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Ashton Kutcher. He was like, way ahead of the rest of Hollywood now everybody wants.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:43:15 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[To be Ashton Kutcher. Very smart. She's.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:43:16 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Ashton Kutcher was a very smart guy in that respect. I mean, yeah, he's.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:43:19 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Way ahead, he.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:43:19 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Was way ahead of the game. I mean, everybody now wants to be an Ashton Kutcher. They're like, right. It's like there's LeBron James and there's Serena Williams and there's anyway, alright, so Ashton Kutcher.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:43:30 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[With that money.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:43:31 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Did you get an office? Did you get?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:43:33 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[A staff and how?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:43:34 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Many did. Were you able to hire a?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:43:35 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Bunch of people. Yeah, we hired a few people. We did get an office very close to the Carnegie Mellon campus. OK. And, you know, we started working on it and and that.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:43:43 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Time pretty much everybody told us.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:43:46 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You're not going to be able to beat Rosetta Stone. Like why would anybody use this? You know, we just kept on saying, well, because it's free, this is going to be free. Then that was our our main selling point. We didn't know if it was going to work, but we, you know, we worked on it and we launched we launchedduolingo.com in 2012.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:44:04 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And it was very fortunate that I had given a Ted talk about this.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:44:09 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[As soon as that went online, we got a ton of people come to duolingo.com to try and to try it out, and it started growing pretty fast because it was a free way to learn a language. And you know, at the end of your lessons, we would say, hey, here's this article, you want to help us translate it. And we, we landed a contract with CNN.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:44:29 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[On a contract with BuzzFeed.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:44:31 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That we are going to translate all their news from English to Spanish.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:44:35 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[How, by the way.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:44:35 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[How did you convince that? I mean, it was it was it relatively easy to.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:44:40 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[We're just cheaper. It didn't cost us any money to to get the translations our users were doing it. We just said, oh, how much do you, you know, pay for? At the time it was like they paid, like, $0.10 a word we said looking for five for $0.05 a word. And it worked. You know, the translations.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:44:52 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I got you.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:44:55 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Worked on everything. There was one problem.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:44:58 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[The amount of money that we were going to make was actually relatively small, and it's because translations are. It's a pretty \*\*\*\*\*\* business translation.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:45:06 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It's $0.05 a word, but then pretty soon, suddenly you know the the people from BuzzFeed found somebody else that would do it for four cents a word because it would. And then we're like, fine, we'll do 3.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:45:15 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It's a race to the bottom.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:45:17 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It's a race to the bottom and then computers are getting.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:45:19 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Better at it. And by the way, you you. I'm assuming you didn't want to found a translation service. You were founding an education company.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:45:26 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That's right.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:45:27 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And when one thing we realize is whilst we were executing on these contracts, we realize that's where the money is coming from. So we're spending more and more of our effort making sure the translations are accurate as opposed to.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:45:37 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Teaching well and.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:45:38 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And it was there was no ads. It was just a website initially. And but you had a lot of people who signed up, right? Like a.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:45:40 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[No, ask.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:45:45 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Couple of million? Yeah, exactly. We were growing. It was good. But then a couple of things happened. The first thing that happened is we realized this was not going to be a great business. The other thing that happened is.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:45:57 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[We hired A1 engineer and a summer intern. They started on the same day on a summer and we told them, hey, the two of you, you don't know each other. We've heard these apps are the thing now instead of websites or they're starting to become the thing. Can you too make a companion app to Duolingo?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:46:16 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[To duolingo.com, let's try that. That's going to be your, you know, kind of summer project. Let's make a companion app to duolingo.com. They came back at some point, they said, you know what? It doesn't have to be a companion app. We can actually do.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:46:27 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[All the functionality of.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:46:28 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Duolingo. We can fully learn a lot of aspects of the language.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:46:32 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[From this app.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:46:34 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So we developed it, we launched it and we were at exactly the right time because there were other apps to learn a language in the App Store, but they were pretty crappy and also cost money. And so very quickly this became the most downloaded education app of all apps.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:46:51 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Wow. And you guys were there, like, right as a?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:46:53 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Apps were like totally starting to explode.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:46:56](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Good.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:46:56 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah, that's right.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:46:58 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And how were you just curious, how were, I mean, you did not have an. I mean, you're an educator, your professor. But how were you building a curriculum in different languages? Where?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:47:07 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You have. This is great. I mean we we didn't. We had no idea. I mean, we went and read some books about how to teach languages. And first of all, most everybody does not agree on what the best way is.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:47:19 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[To teach a language.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:47:20 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And then so we thought, OK, this is pretty hard. Let's just take what we can from the.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:47:23 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Books and put it out there.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:47:26 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So I made the first Spanish course myself because I'm a native Spanish speaker. Severin made the first German course himself.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:47:33 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And this is going to be just like kind of the gamification model where it was just level up level up level up level up.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:47:39 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yes, that's the other thing that we realized in the process when we started making the first versions of the courses, we had people try it out and people would say, Oh my God, this is really boring. The hardest thing about learning, learning something by yourself is staying motivated. So let's make it fun. So.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:47:56 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Fortunately, early on we made something that was both fun and also thought your language.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:48:02](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[OK.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:48:02 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Alright, so you so you launched this thing?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:48:05 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Is it pretty clear to you?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:48:07 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You know, by the end of that year, by 2013 and I think you got 15,000,000 users by the end of that year.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:48:15 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Was it pretty clear to?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:48:16 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You that it was not going to make money. It was not going to be sustainable just by doing contracts with news organizations.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:48:21 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It was, it was, and particularly because we couldn't figure out how to make the translation stuff work on our app, just people couldn't type that much in the app, etcetera. So we just could not figure that out. And the majority of our users were in the app.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:48:34 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So I made the difficult decision to cancel those contracts and forget about trying to make money and justice raise more venture capital.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:48:42 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And sure enough, we we we had some very good investors who decided to invest and that's how we were sustaining ourselves.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:48:49 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So you're basically sustaining yourself off investment cash, but did you feel like you had to, you had to change your business model?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:48:57 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I mean that you know this, by the way, has been one of those biggest struggles with Duolingo. Our mission from the beginning has been to give free language education. This is why we started the company. That is the thing. There's an easy way to make money here, which is just charge for it. And so when we talk to investors, the first thing I would tell them is look, the the one thing that will not change is I'm not going to charge.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:49:18 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[For people to learn a language.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:49:21 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And so, you know, people would invest and I think a lot of times they invest in, they would think.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:49:25 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[OK, eventually they're.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:49:26 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Going to charge? Yeah, but I told them, you know, I'm not going to.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:49:29 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Charge. And so we.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:49:31 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[We raise funding. I mean, we raised, I don't know, at some point we had raised close to about $100 million and with.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:49:37 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Wow, wait. Hold on. Stop, puss 100. I mean, you're not manufacturing a product in the factory. What? I'm just thinking it's ones and zeros in a computer.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:49:48 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You got it. Here's the thing. You want to hire really good engineers and really good designers and really good product managers. They are not cheap at you. You have to pay.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:49:48 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Tell me what's so expensive?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:49:57 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I get.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:49:59 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And that's that's the that's the.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:50:01 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Right. These are the most expensive software engineers and the most expensive part of and. But you're based in Pittsburgh. You're not based in California.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:50:08 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Correct. And you would think that because we're based in Pittsburgh, you yeah, it's not true. There's a reason from the beginning we decided we're going to hire only the.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:50:12 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You cheaper.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:50:18 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Very best people and the very best people have offers from companies in California.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:50:22 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And they say I have this offer that is for, you know, I'm just graduating from college. I have this offer that is for 130.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:50:27 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[$1000 are.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:50:28 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You going to match it or not? And So what you do, but we had no idea how we were going to make money. I mean, the first way we tried, which was these translations we had given up on.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:50:39 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[At some point we raise money from Google. Capital G is one of their investment.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:50:46 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Farms. We raise money from them. It's I believe it's 45,000,000 bucks that we raised.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:50:51 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[From them.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:50:51 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Wow. You know, I was feeling good. I I thought, OK, well, we can continue raising money for a while. Like, whatever. I don't know. I don't need to figure out how to make money. We can just continue raising money for a while.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:51:01 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And partner from that firm sat me down and she said, you know, you're not going to find a bigger fool. We're the biggest fool and nobody else will invest in this company if you don't figure out how to make money. If you have 0 plans to make money, nobody else is going to invest in this company.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:51:06 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:51:16 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And that's when we that's when we started kind of freaking out and try to figure out how we're going to make money. And and that was a.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:51:21 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That was a difficult time for the company. Yeah, but, I mean, it doesn't seem like it would have been that complicated because you could just.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:51:30 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Run ads right? Were you? Was it part of you? Was it part of you? Like, uh, ads? Yeah. I don't want ads.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:51:31 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:51:36 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yes, we were very precious about this. We cared a lot about the user experience in Duolingo and we thought first of all, we're never going to.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:51:45 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Put ads in.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:51:45 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Here, secondly, we're never going to charge people.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:51:49 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And basically, Layla from Google was like, well, I don't know how you're gonna make money because these are the standard ways of.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:51:54 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Making money. But you gotta figure it out. This is an important point because I think a lot of businesses start out this way with really strong principles that seem right. Yep. But when you say that, you actually kind of put your box yourself in because sometimes.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:51:55](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Hmm.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:52:10 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[There are reasons to do some of those things in order to accomplish the bigger goal. For example, of delivering a free product.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:52:18 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You are completely right, right.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:52:19 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So you had to.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:52:20 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[We do a 180. You had to have hard conversations with people and say hey, you know we we gotta start thinking about maybe advertising on our site and maybe.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:52:28 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[We we did at the time we had, I don't know how many employees 60. But it's funny because the people we had hired early on they had offers from you know companies that were had much bigger names than us, Facebook, etcetera. And the reason they had come worked for us is because they really believed in our mission of kind of giving free language education. So we had ended up with basically 60.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:52:49 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[To 70 zealots.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:52:51 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Who all just wanted to give free education. Yeah, the mission, like, we're here for the mission. To this day, it is still like that, which is great. But we had a year of turmoil where basically, we're like, OK, well, we need to figure out how we're going to make this sustainable because we're not going to be able to raise much more funding. You know, if we never make money.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:52:52 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[The mission.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:53:10 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I'm so sorry, but there's gotta be a way to make money.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:53:13 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And if you don't have money, you don't. You don't.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:53:15 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Have a business. We don't have a business and we're not gonna be able to reach the number of.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:53:18 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[People.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:53:18 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[We want to reach at some point enough people got convinced that, OK, we'll put an ad at the end of every lesson.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:53:26 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I remember we showed it to our head designer who he he almost vomited.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:53:32 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I get it. I mean, did people say to you or did you get the feeling that like, I don't know, people thought that you were selling?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:53:39 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Out.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:53:40 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah, I think so. And now I, you know, I don't think it's too many people because I think I myself went through a transformation that took me. It took me several months to go through the transformation, so.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:53:50 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And you know, we put the ad at the end of every lesson, and fortunately, that actually it gave us quite a bit of money. I mean, as soon as we put that at our run rate, went from zero to like.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:53:59 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[10.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:53:59 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[1,000,000 bucks a year. Wow. One tiny ad. It didn't even cover the whole screen. Ohh, we you know, we use Google ads. So they came from everywhere like random random places.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:03 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[What was their company?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:06 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[OK, just Google it OK.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:09 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[OK.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:10 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Not late night bootycall.com.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:12 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Though I hope.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:14 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[No. And soon after that we got a bunch.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:17 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Of.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:18 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[People who would tell us, hey, I don't like ads. Can I pay?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:20 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You to turn.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:21 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Off the ads and we thought, OK, how about we launch this subscription service where the main thing is you can pay us to turn off the ads, it turned out. And this is just we really just didn't realize this.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:34 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Subscriptions made us a ton more money than the ads and and.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:38 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[What? What? What was it? What?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:39 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Would it cost to?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:40 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Subscribe 999 per.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:42 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Month. OK, so a little bit more than Spotify but and but through that you could do any language you wanted any course?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:48 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[With no ads.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:49 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Right. And if you didn't want to pay, you just have to watch, you know, see the ads at the.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:53 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah. And so all of a sudden.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:54 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[End of the lesson.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:56 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You had people who?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:54:57 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Were willing to pay some money, but still, I mean we we of course I know we know the advertising model and podcasting and and it's still a small percentage of people. When you got a freemium version, right? Even Spotify most.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:55:11 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[People are still.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:55:12 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Getting it for free and dealing with the.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:55:15 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yes. So well, at first there was very few by now. I mean it's been a couple of years since we added our subscription by now.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:55:21 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[3.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:55:21 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Percent of our users pay for the.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:55:24 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Which is a lot because how many total users do.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:55:26 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You have a lot. I mean, yeah, I mean active users right now we have about 40 million monthly active users and about 3% of them are are paying subscribers.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:55:29 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[10s of million.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:55:39 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[All right, now here comes.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:55:40 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[The the the tough part, which?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:55:41 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Is Duolingo, of course is free, so you know it's a free offering. But of course, even with free offerings, there's there's gonna be criticism and you know, there have been professors who who specialize in this have said.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:55:55 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You know you can't really get that proficient with Duolingo. You know, I maybe I can learn some words or phrases, but it's not. Doesn't really actually teach me a language. And and before we dived it into this, just in general, when you hear this criticism, does it make you defensive or does it make you think, like maybe we got to make this a?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:56:15 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Better.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:56:16 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[The truth is, there's a lot of marketing out there that tells you that you can learn a language in nine days. This is not true.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:56:24 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Actually learning a language takes years. Yeah, this is this is the first thing to to understand. Yeah. Secondly, there's there's various levels, of course. Duolingo teaches you pretty well from zero. So starting from the beginning to about intermediate, depending on the language that you're learning, if you want to use dual language and start from zero.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:56:43 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And get to the point where you're the poet laureate of that.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:56:46 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Country that is unlikely to happen. Yeah, with Duolingo by itself, that's just not going to happen. But the way we see it is a we keep getting better and better. B If you look at any single method, I mean take the for example, the single method of US high school education gap.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:57:04 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It kind of doesn't work very well. How proficient are people who take Spanish throughout high school at the end of high school?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:57:11 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[On average, not that proficient, right? And our goal with dueling when we're not there yet, but our goal is to.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:57:16 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Get people from zero.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:57:18 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[To a level of the language, it's a level called B2, which is where you can get a knowledge job in that language. You know Google for example. Employees software engineers here in the United States, whose English level is B2. OK, that is our goal. We're.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:57:33 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Not there yet, so we interviewed James Park, who created Fitbit and Fitbit the genius of Fitbit.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:57:38 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It was like a gamified exercise, right?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:57:40 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Like people like.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:57:41 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Oh, I did 10,000 steps today or, you know, I made.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:57:45 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It's hard to get humans to change habits, so how do you get, let's say, a a significant percentage of people to finish a a language program?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:57:52 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah, this is what we spend a lot of our time on and you know this is one of the things that when we get criticisms, one of the things that they don't take into account is a lot of the research about how to teach a language is done with people who.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:58:05 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Are in some sense held hostage in the classroom, right?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:58:09 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[The hardest thing about learning a language is saying.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:58:11 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Activate.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:58:11 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:58:12 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So we spend a lot of effort trying to make Duolingo more motivating and more fun, and the way we do that is just by adding game elements. I mean using dueling a lot of people refer to it as playing Duolingo. It's just, it feels a lot like like playing a game.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:58:26 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You get you get rewards, you get like, level.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:58:29 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Up kind of thing.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:58:30 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That's exactly right. And other things we do, for example here. This is another interesting thing we do. We want you to use tooling every day. I mean, the truth is, if you actually want to.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:58:38 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Learn a language you got to turn it into a habit.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:58:41 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[One thing that is really powerful for us is send we send you notifications.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:58:45 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So we have a pretty sophisticated artificial intelligence system is one of the most sophisticated things we have that figures out when to send you a notification and what to say in them. Yeah. And for example, one of the most powerful things we, you know we've done is after about 5 days, if you haven't come back, we send you a notification that says these notifications don't seem to be working. We're going.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:59:02 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[To stop sending them for now.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:59:05 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That turns out to be an extremely powerful way to get people.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:59:08 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[To come back.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:59:08 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Huh.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:59:09 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Because they feel guilty that we're stopping to send the notification, so that gets them.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:59:14 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[To come back. Yeah, it's like, hold. You gotta hold people accountable, yes.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:59:18 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[This, which is very hard.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:59:19 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[This is why people have personal trainers, because otherwise they won't go to the gym. Yeah, but why would somebody?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:59:25 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Pick Duolingo over any other language app you mentioned. Rosetta Stone, for example, right, and I'm I'm sure you've looked at it, and I mean, obviously you're a competitor, but they probably do a decent job teaching languages, so why wouldn't you just like?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:59:39 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Do.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:59:39 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:59:40 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah, I mean, before we launched, Rosetta Stone was the biggest thing in the world and everybody told us you're not going to be.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:59:45 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Able.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:59:45 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[To beat them. Yeah, by now, I I would say we probably have 50 times more users than they do. Our revenue is probably 5X their.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:59:54 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Revenue. Oh my.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[00:59:54 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[God, something to that effect. There's a big reason. It's the fact that we're free and this is.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:00:00 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[One of the things that.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:00:01 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Our mission, which is really giving free language education.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:00:05 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I think it's actually good for business.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:00:07](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:00:08 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[We don't spend very much in marketing. We have all these people, 97% of our users.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:00:12 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Don't pay.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:00:12 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Us. Yeah. So it's just I think we just have this huge user base of people who are basically a marketing engine, but a lot of companies in education eventually turn into marketing companies.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:00:25 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:00:26 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[For the following reason, you realize man making improvements in how well you teach is hard, and it really is very hard. It's it. It takes years. So for every dollar you have, you quickly realize it's actually better to spend your dollar marketing your product rather than making your product better. I've been, you know, hardliner on this. We spend all our effort.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:00:41 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Hmm.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:00:45 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Making the product better and the main reason is I think we're really in it kind of for the long term and I think in the long term the better product will.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:00:52 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:00:53 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And This is why we don't spend so much money on marketing.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:00:56 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Lease in December of 2019, your company was valued at $1.5 billion.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:01:04 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Now we are all in a very different world. A lot of the businesses that have been on how I built this are really struggling, huge companies, airlines, you know products.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:01:14 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Them they're in trouble. Some of them will not make it through this. Are you guys seeing a negative impact? Are you seeing people or or because people are stuck at home? Maybe different. I mean, Netflix is doing great. What's going on with you guys, right? Because you're all remote working remotely, presumably.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:01:30 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[We're all working remotely. Yes, I'm here just by myself. I came here to record this. Yep.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:01:32 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Just you.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:01:35 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And we are closer to the Netflix we are, we're seeing increased demand.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:01:41 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Like significantly increased.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:01:43 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yeah. Significantly, our revenue has gone up about 50%. So we used to make about $400,000 a day. We now make about 600.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:01:51 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[$1000 a day.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:01:51 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Wow.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:01:53 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[But the ad market is drying out.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:01:55 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Oh yeah, but we make very little money from our ads. Most of our money is from from subscriptions.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:01:59 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So because people are sort of stuck at home, you're seeing people signing up for Duolingo.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:02:03 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Yes, we are seeing that. And and the interesting thing is we see it. You know, we have users everywhere in the world, only 20% of our users are in the US we've seen it in every single country and this is an this amazing thing, the first country we saw.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:02:09 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Hmm.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:02:14 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[It obviously is.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:02:15 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[In China, as soon as there was, you know, social distancing measures in China, our traffic in China doubled.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:02:23 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And I kind of never thought it would happen.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:02:25 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Anywhere else but.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:02:28 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Soon after that, Korea was like that. Japan was like that. Then Italy went like that. The rest of Europe went like that. Then the US. And so we're seeing a massively increased demand because of.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:02:39 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[This.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:02:40 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So. So what's the exit? I mean, you got investors, obviously they convinced you were convinced that you had to keep it sustainable and to grow it and and have valued at $1.5 billion. And I know you're not public, so you don't probably disclose your, you know, whether you're profitable or not, but sounds like you're, you know, keeping the lights on pretty well. What? What's?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:03:00 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[What's the end game? At some point, you know it's sell or go public.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:03:04 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[The end game here is to go public. That's what we've been working towards. It's going to be very difficult to say these days when we're gonna go public because you know, with this whole COVID thing, the markets are really.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:03:16 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Crazy.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:03:17 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[But we, you know, we have the revenue now to be able to go public. We are cash flow positive.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:03:24 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And one of the things that I think is really important is.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:03:28 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[The way I see it, we have so much more still to go in terms of how much better we can teach and and also teaching other stuff. We recently released an app to teach reading to young kids. It's called Duolingo ABC. I think there's a huge amount of impact that we can do with that. Yeah. So I mean, to me, it's just keep going with this I that's that's the goal.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:03:49 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[List given all of the things that have happened.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:03:51 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[To.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:03:51 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[You, I mean your incredible success. How much of that do you tribute to your intelligence and how hard you worked and how much do you think it's because you were lucky?](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:04:01 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I was definitely lucky. I mean launching an app.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:04:05 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[At the time we launched the app was exactly the right time and launching an app in late 2012 was a really good time to launch an app. So you know I've I've been incredibly lucky. I I think that and I think just hard work on the same thing I I get obsessed with the same thing. I mean, I've I've been working on building for now eight years and.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:04:25 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[I'm pretty obsessive about it.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:04:27 Speaker 1](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[So I think it's both.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:04:30 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[That's Luis von Ahn, co-founder. Both Duolingo and recaptcha, by the way. Louis says that having a tech company based in Pittsburgh actually helps to attract top talent, even from places like Silicon Valley. For starters, the median price of a home in Pittsburgh today is about $180,000.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:04:49 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[In San Jose, it's almost $1.1 million. In fact, a while back, Duolingo put up a recruiting billboard in San Francisco that simply read.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:04:58 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Own a home.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:04:59 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Work in tech moved to Pittsburgh.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:05:04 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And thanks so much for listening to the show this week. You can subscribe wherever you get your podcasts. You can also write to us at hibbett@npr.org and if you want to send a tweet, it's at how I built this, or at Guy Raz. Our show is produced this week by Casey Herman, with music composed by Ramtin Erebuni.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:05:24 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[Thanks also to Julia Carney, Candace Lim, Eva Grant and Jeff Rogers. I'm Guy Raz, and you've been listening to how I built this.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:05:37 Speaker 2](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[This is NPR.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:05:43 Speaker 5](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[How do we reinvent ourselves and what's the secret to living longer? I'm manoush zomorodi each week on NPR's Ted Radio Hour. We go on a journey with Ted speakers to seek a deeper understanding of the world and to figure out new ways to think.](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[01:06:00 Speaker 5](https://1drv.ms/u/s!AMhVeraEIITCz1g)

[And create listen now.](https://1drv.ms/u/s!AMhVeraEIITCz1g)