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JOSEPH HADZIMA: OK. Welcome to this session of nuts and bolts, where we're going to talk about business models or venture models. Bob Jones the other night, talked to you about finding your customer. And if you remember how he did that with his guitar lesson example, he looked at different customers, different pricing points. That's the beginning of what a business model is. The model says, how are you going to make money or how are you going to develop a sustainable business?

And tonight, to tell us about that, we have Rich Kivel, who has been a serial entrepreneur and an investor and has seen many business models over the years. So Rich, I'm just going to turn it right over to you and take it from here.

RICHARD KIVEL: Thank you, Joe. Perfect. Good evening, everybody. This is a fun topic, because it actually gets into the nitty gritty of how do companies make money? How do you think about bringing the product, the invention, the technology, the idea, the service that you're ultimately thinking about building, how do you ultimately get it to a point where you're able to generate revenue and ultimately returns for your investors, whether that be your venture investors or strategic partners? Or maybe you've angel funded your company and you really have yourself and a couple of friends that really want to make something special have an impact.

So I'm going to talk a little bit about business models. Just my background real quick was the whole first part of my career was on the operating side of companies. So sales, marketing, partnerships. First time I became CEO was a long time ago when Joe and I actually met. It was an MIT spinout. It was actually a company that had won the MIT Business Plan Competition.

And a couple of years later, after I exited a technology company, I got a call by the investors, and they were looking for somebody to run this company. They had a whole bunch of incredibly smart engineers and physicists and others, and they needed somebody that had operations experience, how to build the business model.

This was back in the days of the Human Genome Project, for those of you that are in the life science area. In fact, just show of hands, life science people here, healthcare, biotech? OK. Tech tech, hard tech, deep tech, robotics? Excellent. What other areas are you guys in? Software. Yeah. So SaaS platforms, big data, analytics. What else? Oh, fantastic. Any specific realm? Geothermal. Excellent. Good.

So essentially, when I got involved with this company, it was basically a company doing software called Bioinformatics. They were building software that would allow scientists and researchers working on the Human Genome Project to communicate with all of the instruments in their lab, which nowadays we just simply take for granted. You plug in just like your printer in your office. You plug it into the wall, it shows up on your iPhone, and it shows up on your computer, and everything is simple.

But back then, when somebody sitting here across the street or diagonally down the street from us at the Whitehead Institute or the Broad Institute, were doing research, everything in their lab essentially was autonomous. So you got a new pen tool, robot, or microarray, and it showed up with its own computer and a tower of a computer stack and a screen and a keyboard and a mouse, and it ran its own software.

And then you would go down to the refrigerator that was a barcode scanning refrigerator with all your samples, and that refrigerator had its own computer. And then the scanner, the robot, everything was running autonomously. So engineers were essentially put in a position, and scientists were, they had to build Excel spreadsheets to track all of this data. So import export, just constant chaos.

And that became more and more difficult, as you can imagine, as the machines, the instruments, as we called them, the robotics and the scanners started taking so much more data. It was easy when you had a small microtiter plate and you had a little pin tool robot putting a little DNA sample into a well, and then it would show up once you imaged it. But that's really hard to do when you're doing tens of thousands or millions of data points at once.

So our software essentially figured out how to communicate with all the instruments, writing APIs, things that we all take for granted now, and then helping downstream. So step one was really capture of the information. Then step two was visualize the information. So we caught all this information off of all these instruments in the lab. We then can visualize it. We can see it. We can decide whether this gene is overexpressing or underexpressing. And then downstream was the data mining. How do we create value from the information?

And what's funny is I had no background at all in biotech pharma, 0. I didn't know how to spell bioinformatics. I think I might have went on Yahoo! back then and figured out what the hell it meant. But truthfully, it really didn't matter. At the end of the day, we were building software for scientists. And what mattered was, were we creating value out of this invention?

So what you think about now, whether it be that you are working in the energy industry, whether you are building drones that are capturing information, whether you're building satellites that are actually looking at, let's say, methane emissions, at the end of the day, the value very often comes from the data. And that is the magic of it all. And that's been the case, truly, in a magnificent way over the past 20 years and growing more and more so.

So what's fascinating is when I first had the privilege of doing this class, this exact lecture back in the old days with Joe and Joost Bonsen and that whole team, it was funny. We were looking at business models that were so arcane. It was basically, are you going to sell online? Are you going to sell retail? That was it.

And then you had a couple of nuances. You had computer companies that Michael Dell competing against a company called Gateway. And their novel business model was that they would customize the computer for you based on your specific specifications versus everybody else that basically you walked into your local equivalent of a Best Buy, and you bought the computer they had there based on how much memory you needed. But there was no customization. So customization became a differentiating factor.

And these were very, very small, incremental changes that took place until we suddenly saw ubiquitous Wi-Fi, ubiquitous internet connectivity, where we saw now business models that could never have existed just months or years before suddenly came into play.

So what I'm going to do today is share with you where business models evolve from and how important they are to the decisions you guys make, whether you be the founder entrepreneur, you be the fifth hire in the company, or you're going to work for a big organization, and you happen to have the luxury of launching a new product. At the end of the day, a business model is not only critical to the way the company operates and communicates and brands itself to the world, but it also needs to be flexible enough that it can adjust.

So let's talk a little bit about these things. So starting in the very beginning of it, choosing the right business model is crucial for the success of any company. And for those of you that read some of the background material for this course, one of the definitions is that a successful business must be willing to modify its model to adapt quickly in any market. And that's absolutely critical. That will define whether your business is nimble and succeeds long term or maybe you got lucky and it was a blip on the screen.

As a matter of fact, from that same book, if you guys, I don't know how many of you looked at it, but it was part of the reading of this course, was the business model generation book. And this model or this definition I think is perfect. A business model describes the rationale of how an organization creates, delivers, and captures value. That's it.

And the value can be measured in many, many different ways. Hopefully it's measured on the consumer side, the customer side, the corporate side, whoever you're ultimately selling to, whether it's a SaaS platform and you're selling enterprise wide solutions to the financial service industry, or you're delivering a product to an end user, a consumer. So it's a B2B versus a B2C type of a model.

When we think about frameworks, and this is something that when my career started it was in tech and then in biopharma tech for many, many years, and then a number of years back, I started to move over to the other side of the equation, which was investing in companies. And having been on the operating side, literally out there all the time raising capital for companies, expanding, hiring, firing, succeeding, failing, taking companies from literally eight people up to 85 to 250 to 1,000 people. All of that growth typically happens because the organization is well funded and it has flexibility in its business model.

When I go back for a moment to share with you the company MolecularWare, which was an MIT spinout, that company was building bioinformatics software, software for scientists. It had one business model. It sold to academics when I arrived as CEO of that company. It was my first CEO gig ever. And of course, they sold to the people they knew.

These were all super smart people that came out of the RIKEN Institute in Japan, the Broad Institute, or at that time, I guess it was the Whitehead Institute, and that was the business model. But you can't really scale very well, nor can you be very, very attractive to the investment community if you have one client and that client is academics, or that one client is government.

So we started to think about other models. Some of them we're going to talk about today. So we not only built software for scientists and sold to the academicians, which is an entirely different sales process. You've got different budgetary processes, different conferences you need to attend. But then we developed a series of other sales mechanisms.

One of the first and most successful was because we had relationships with the RIKEN Institute in Japan, we decided that we needed to do more in Asia. And certainly building a sales force in Asia was out of the question for a little Kendall Square company with 15 people. So we started partnering with distributors. So we had this fantastic distribution partnership with a company called CTC. And CTC essentially sold our product for us.

So that became part of our business model. So we had direct to academicians, which was great, because it was the name branding. Harvard bought our software or Lawrence Berkeley National Lab bought our software. But then all of a sudden, we started landing clients in other parts of the world that we could never touch. We could never, ever have afforded to put together a sales force and management and training to sell in Asia, as an example. So distributors became a second part of our model.

And then as we started to build a little bit of a brand for ourselves, we said, how else can we sell? We wanted to sell more into the US and to Europe. But again, building a big sales force was not in our budget. So we then looked at what's called OEM. Who knows what that means? Anybody just yell it out. Original equipment manufacturers.

So we realized, wait a minute, our software, we wrote APIs to all these cool instruments. Cartesian robots, biorobotics, Packard Bioscience, Axon scanners, Applied Precision scanners. Some of those people have really shitty software, and they've got good instruments. We've got amazing software. We're not interested in building instruments. Why don't we partner with them and bundle our software inside of their instrument?

So we wound up landing one of our first deals with Applied Precision in Issaquah, Washington. And they had phenomenal imaging technology, one of the best scanners at the time, but really crappy software. Hard to use, kludgy, it was just a pain in the butt. And ultimately, they started selling more product, because now their software was seamless, fully integrated into their instrument, and it cost us nothing to sell. Every time they sold an instrument, we got a check in the mail. So we went from direct to distributors to OEM and then continued.

So having that experience as an operating person, how to build these international or these national organizations was really based on those experiences. And now my job is I invest in companies. So we have a fund based out of London. We invest throughout Europe and the UK and elsewhere. We're doing a deal in Australia right now. And our focus is about 70% health care and everything else is deep tech, software, SaaS platforms, robotics, all B2B.

So let's talk a little bit about how we see the world. This is also out of the book that was part of this class, which I thought was fantastic. This is essentially nine of the key ingredients, what they call the canvas in that book, the business model generation book, was about how do you think about a business model. And all of these slides will be available, of course, so you don't have to kill yourself to take notes. But I will say this.

When you think about each of these slices of the pie, of course, in reality, they're not all the same size. They're going to change in size based on where your company is, from a standpoint of its product development, its financing, et cetera. But each of these components are so critical and very often they blend together. So you might have key resources or key activities that are being overseen by one of the managers in the company, whereas the entire marketing department is in charge of the value proposition and trying to segment the customers.

But at the end of the day, each one of these things need to move harmoniously. And if you think about the most successful companies, and we're going to use a couple of examples here today, they have somehow figured out how to take these nine little pieces of the pie and have them move in a beautiful way together. And that includes everything from value proposition to the customer segments and then ultimately the cost structure. Because if you haven't modified and design your cost structure, ultimately you're going to start to lose money, which means you're not going to be able to properly support the client, which means you'll have no repeat business.

So each of these things are amazing. For those in here that play instruments, it is exactly that concept of an orchestra or a jazz band. It needs to flow together. And if you get everything moving at the same time and they're all moving with some great flow, you create beautiful music. If your oboe is way off or your violinist is one beat behind, things are just a little bit off. And that creates this ripple effect, these second and third order consequences that ultimately impact the entire pie. The best companies have figured this out.

So taking a look a little bit around how we think about business models, this is nothing new to anybody here, right? We're all consumers. So all of us have dealt with a gazillion different business models, whether we even realize it or not. Of course, subscription business models seem to rule the day. Subscription business models did not exist 15 years ago. There was nothing to subscribe to.

If I wanted to go watch a movie for the weekend and I wanted to do it at home, I got in my car and I drove to this place called Blockbuster, and I walked up and down the aisles. It's about the size of a medium sized CVS. And I went to the adventure section or the romance section or the comedy section. And then I went up to the counter and I had my three VCR tapes or DVDs that I wanted to see that weekend or that period of time, and I brought them home. There was no subscription. I never needed to come back to that store again.

All of a sudden, subscription models started to make sense when you have a new economy, you have a new world where people think less about owning and more about experience. Think about how companies like Zipcar and others. And there's a gazillion different models of equivalent Zipcars throughout Europe, because people say, why do I need to have a car?

In the old days, and I'm talking old days like 10 years, 15 years ago, if you needed to rent a car, it was a nightmare. You're sitting in Cambridge. The closest car rental place might be at Logan Airport. You had to get there. Then you had to go to the rental center. Zipcar comes along and boom, they had a model where I can actually find a car with my phone three blocks from my house, and I can return it to a similar location.

So subscription really changed the world, but there's obviously other models here we're very familiar with. We'll talk about different ones at different times. Obviously the freemium model, all of us are familiar. Certainly the App Store has completely dominated our lives, whether you use an Android or you use an iPhone. Everything's free for three days, and then we're going to charge you. Or everything's free for seven days, and then you're going to get hit with $14.99 a month in perpetuity, and we're going to make it super hard for you to quit.

So the freemium model really came into place, and this was mind boggling in the investment community not that long ago. You're going to give away your product and somehow you're going to become a successful company. So that's another way to think about how do I get to the market? Which one of these or two of these or three of these am I going to choose?

The marketplace certainly has taken over. Think about the marketplace as the Etsys of the world, the eBays of the world, where I can actually myself create a marketplace. I can sell cool t-shirts, or I can wind up cleaning out my garage and selling a whole bunch of neat things that are in there, because I'm part of this marketplace.

The advertising world has completely changed. It used to be dominated by big, big advertising companies, quite truthfully. I mean, there were these massive New York firms that worked with big companies, and those big companies had huge advertising budgets. And it was very, very linear. You bought TV time. You bought ad time in a magazine. So you're sitting there at the salon flipping through People Magazine and a commercial, or I should say, a page shows up and it's promoting some new product. That was advertising.

Advertising now has completely transformed the way we live. We're completely unaware of how often we're impacted by advertising. And certainly, as I mentioned earlier when I gave you the examples of one of my earliest companies, direct sales, OEM, and resellers. Truly foundational ways. They've existed forever, but they are still some of the most important ways to think about getting your product to the market.

If you are building a product, whether it be a software platform or be a technology instrument, or it winds up being a widget that actually helps people that are photographers work better, you have to think about, how am I going to get this in the most amount of hands as possible? And the OEM reseller, and essentially the direct sales market is still the way to do it.

Think about in the area of pharmaceutical biotech. They still have direct sales forces, because doctors are busy. They don't have time to watch advertising. They're certainly not signing up to any freemium. They can only attend so many conferences. So you need to physically be there to actually educate them.

So think about each of these. In fact, everybody here using a laptop is probably most familiar with the OEM model. Every one of our laptops, you open it up and if you're using a PC, it has a little sticker on it. Usually it says Intel inside. I mean, that's ingenious. I've never seen an Intel store in my entire life. They could care less about who I am. They're not selling direct to consumer. They don't care about B2C. They don't even care about B2B. They care about B2M, business to manufacturer.

So they say, I'm not going to sell to Johnson & Johnson, or I'm not going to sell to Gillette or Fidelity and try to get them to buy a bunch of Intel stuff for their computers. I'm going to sell to Dell. I'm going to sell to ThinkPad. I'm going to sell to the manufacturer. They're going to do all the work for me.

So the magic that we actually have in the world of technology is that we have so many options, which is fantastic. So think about different business model examples that just touch you every day, whether it be new clothing you buy, your Apple Watch or your iPhone, a laptop that you purchased, or some sort of a service that you recently picked up because you read something great about it on your phone.

So let's talk about different industries and sub-industries, because there's lots of ways to think about business models. So the first two examples I'm going to give you are really known to you, of course. And then we're going to talk about industry specifics.

So the number one example I think all of us know is Netflix. So for those of you that remember, anybody here remember Blockbuster? I find every year, Joe, the number of hands goes down. I'm getting really old, but this class stays about the same age, so the number of hands keeps going down.

But Blockbuster was absolutely amazing. They owned the world when it came to video. And even when things went to DVD, they still had all of that physical real estate. And then the guys in Netflix came along. In fact, there was a slide I used to use in this presentation, and it was actually a billboard that was on Route 101 outside of San Francisco. And it said, "Follow your dreams. We used to mail DVDs. Netflix." And that's what they did.

The guys at Netflix figured out, geez, the idea of owning 500 or 1,000 shops in strip malls around the United States, manning them with human beings, worrying about security, inventory, shipping, receiving, returns. Oh my God, that's exhausting. Why don't we just put a bunch of warehouses around the United States, load it up with DVDs, and when people want a movie, we just mail it to them. And if they keep it for a day, so what? If they keep it for 10 days, we don't really care. We'll just literally print another movie. So that transformed the entire way that all of us thought about movie rental back then.

Now, keep in mind, it was a sign of the times. There was no bandwidth. If you wanted to download a movie, when Netflix first came out and started shipping DVDs in an envelope, if you wanted to download a normal feature length film, it could take six, seven hours to download. It would take two to three times the length of the movie to download it to your computer. It would eat up all of your memory, and then you would watch it, and then you would delete it, and then you would do it again.

So they realized this download stuff is just not for us. We're going to send people DVDs on demand. Everybody in the world ran out and bought a DVD player. So for companies building DVD players, it was awesome. They were like, oh my God, this is heaven. Netflix literally built the DVD industry.

So that was their business model. Convenience. No late fees. Two days after you order it on a Tuesday, bang. It's at your house on Wednesday or Thursday. You watch it over the weekend. Maybe you shared it with some friends, and then you sent it back in an envelope. It was amazing.

And they then created a little bit of a subscription service where if you paid a certain amount per month, you were able to at any one time have three DVDs. Or if you paid a tiny bit more per month, you were able to have five or six or seven DVDs, which is great if you have a family that's got a bunch of kids who are watching one thing and you have parents that might be watching something else. So they were essentially doing direct to consumer mailing, and they created subscriptions.

And then the world changed. Netflix, like Blockbuster, could have easily gone bust. There's no more Blockbusters, but Netflix could have easily gone bust. But they figured out that if we incorporate technology, we can begin to stream movies. They didn't abandon their whole business model. They slowly moved into the streaming service.

And people were like, this is fantastic, but it's the same company. Before they used to send me a DVD. Now I hit a button and now it streams to me. Sometimes you have a little buffering issue, but it's OK. And this is quite a few years ago. Who would have thought Netflix, which was a company that shipped DVDs and offered streaming with lots of buffering and slow points, would become what it is today? Think about the business model that Netflix has today.

What does Netflix do when you think about them as a company, forgetting about their original business for a minute, how do they make money? Who are they competing with now? They were competing with just Blockbuster. That was it. Tell me what you know about Netflix besides the fact that you can go on to your Netflix app, on to your smart TV, or on your iPhone or iPad and watch a movie or download it for your plane ride? Besides that, what do they do? They produce movies.

Can you imagine the CEO of Netflix back in the days when he was shipping DVDs to people's homes telling his investors, someday I really want to compete against Hollywood. You know Paramount, MGM? I think I want to compete against them. They would have thought, dude, you're completely out of your mind. You ship DVDs. This is basically a mail order company.

They have now become one of the most powerful producers of content in the world. They're winning awards left and right and crushing all of the old fashioned movie production companies and TV production companies. What else do they do? What is something new? Go ahead.

AUDIENCE: As of, I believe, February 1, will raise every subscription price by $1 or $2, depending on the level. All 315 million of them.

RICHARD KIVEL: And even beyond that, they then introduced the password protection non-sharing policy. All of the investment community was like, oh my God, they're going to get crushed. People are going to run. They increased the number of subscriptions. The day they announced no more password sharing, their increase in subscriptions over the following week was something like 18 million new subscribers. Because now I can't give my password out to my friend and my kid and my kid who gives it to his girlfriend. Now all of a sudden they're like, oh shit, I'll just open my own account.

So these incremental increases in subscription, which is really hard to do. But once it is literally part of your life, you're not going to give that up. And then on top of that, without even increasing prices, they increased revenue in number of subscribers exponentially just by saying this password sharing thing has to be very limited.

So that is something else that they have done, which I guess you could say, it's not necessarily a new business model as much as it is tweaking and fine tuning an existing business model to become more profitable without punishing the customer very much. They didn't double their prices. They essentially said normal cost of business increase, but you can't share your password. And most people knew I shouldn't be sharing my password anyways. So they didn't lose anybody. They gained something like 18 million.

Think about this. They have just hit 300 million subscribers this week. It was just announced.

AUDIENCE: Today. I think it doubled.

RICHARD KIVEL: Yeah. So you've got a company that now has-- we're talking about the population of the United States. I don't know. What are we at as a country, 400? Something like that? 300 million people are subscribers and pay every single month, whether they watch a movie or not. I mean, how awesome is that?

And on top of that, they now have a market capitalization of $400 billion. Do you realize it's kind of nuts. That's bigger than the GDP of most countries. Look up the GDP of Greece, Italy. Look up the GDP of Ireland. They have valuations that compete with the GDP of big countries. Google is probably the greatest example. They're actually the one that I often think of from the standpoint of competing against GDP, against market cap. I mean, it's mind boggling when you think about it.

But something else that they've done, because they keep changing their model. They got into producing TV shows. They then got into producing-- or movies and then TV shows. They now have some of the world's best actors, actresses chasing them. Can I get in your next show? Years ago, no actor wanted to be in a TV show. If you went from commercials to TV to movies, you never went back. I'm not doing a series.

It's to a point now where you've got people like Nicole Kidman, top actors and actresses saying, are you guys doing a series? I would love to do a series. How cool is that? I get to do 20 seasons, five seasons, 50 episodes, whatever the number is. It's absolutely incredible the impact that they've had on the industry and on Hollywood, and they started off mailing DVDs. That was their business model.

Something new that they've done. Live events. Never before. Something else?

AUDIENCE: They use the [INAUDIBLE] suggestions and also design suggestions.

RICHARD KIVEL: That's a really excellent point. It goes back to what we talked about earlier, right? It's great that you have software that does A, B, and C, makes life easier. It's cool that I can actually search the hell out of this massive library of movie options, but it's actually using technology, deep learning, data mining, AI now to help me find things that are more relevant based on my own feedback, whether I gave it a thumbs up or a thumbs down after I watched a movie. They know if you started watching a movie and then you killed it and you never went back to it. I mean, there's so much data. So what you have there is more personalization, which, to use an old term, is stickiness. Of course I'm going to keep using this, because they've made my life easier.

And now they're doing live events. Think about what you're seeing now. They have done fights. They have done a number of other type of live events. That starts to really be interesting. I mean, could we be watching the Super Bowl on Netflix in five years?

AUDIENCE: We just watched the Christmas-- the NFL Christmas game. Either Christmas or Thanksgiving.

RICHARD KIVEL: Yep. Absolutely. The Tyson fight. Think about that. So they're essentially modifying change in their business model. They're a great example.

Next one, of course, is Google. This is easy. I mean, you've got a company here, and I think this is really the one that I should refer to when I talk about market cap versus GDP, not so much Netflix. But 2.4 trillion market cap. That's whack a doodle. It doesn't even make sense.

And what did they start off doing? Search. That was it. They were going to build a better search algorithm, because there were a whole bunch of really smart people out of Stanford and elsewhere that said, search sucks. This just doesn't make sense. And humans aren't going to learn Boolean logic and put quotes here, a plus sign, plus this asterisks. We need to come up with better ways of searching. So they brought technology in and increased the value of search.

And that's all they were was another search company. For those of us that remember those days, there was Lycos, Yahoo! Gosh, I can't even remember all the names. Amazing. I mean, I think Lycos was a Boston company, right? Unbelievable. And I remember at the time thinking, do we need to start another search engine? I mean, this doesn't even make sense. They crushed the search space.

And they could have stopped there and still been relevant. But then they moved into other parts of the world. What are some of the other things that they have done from a standpoint of transformative business model changes that makes Google relevant? How else do all of us use Google or most of us?

AUDIENCE: Google Drive.

RICHARD KIVEL: Google Docs, Google Drive. I don't have to think about documents. Basically, I can go onto Google Drive, boom, use their Excel spreadsheet, save it, live action. My team, most of which is based in Europe, can all work on the same Excel spreadsheet at the same time, and it's instantly changing. We don't have to keep version 1.1, version 2.25, then I send it off to this person who makes some other version, and then we're missing the changes done by somebody over the weekend. Absolutely incredible. So that became another subscription model, another way they demonstrated their prowess in technology. What else does Google do?

AUDIENCE: Google Voice or Google Maps, both of which I use 12,000 times a day.

RICHARD KIVEL: Exactly. So think about Google Maps. Cool, free. The data analytics behind Google Maps is where all the value is. They know more about the Earth than most anyone. They know the topography. They know which ships are moving in the ocean. They know more about us than anyone in the world, whether it be the fact that we searched something and they now know that about us.

Google has an entire group devoted to health, global health, that integrates with global health organizations like the NIH. If there is an increase in the number of searches, let's say, in the Pacific Northwest around particular symptoms. Runny nose, head fever, puking, you name it. Let's say little kid symptoms.

Once Google starts to see that trend, then in the Pacific Northwest, let's say Seattle, blah, blah, blah, they're starting to see this, that becomes a biomarker. That becomes a data point. And they track that. And then they can share it with health organizations because they know that the flu this year hit that part of the region really hard.

And what does that mean? Well, it has this ripple effect of power where it's like, that's cool to know, but what if we also let clinicians know, especially pediatricians? What if we're able to then communicate, sell our data to groups like PPD or some of the big pharmaceutical biotech companies like Johnson & Johnson that make over-the-counter medicine for kids suffering from the flu or vomiting or whatever it is?

Think about that. It is an entire shift in how data collected from a company that did nothing but search now actually transforms the way health is actually treated. And when you start to see severe illnesses, you start to see things that are scary, that information is then communicated to the NIH.

So every year we make new flu vaccines. They've got a pretty good high probability of working, because many of them, they're designed for multiple strains. But sometimes it just doesn't work so well. Once they're able to identify there's a new strain or a strain that is resistant to a vaccine given in that particular region, action can be taken. Think about that. It's absolutely mind boggling.

Think about the fact that they're able to use their satellites and Google Earth and other things to actually help predict weather. There are companies in the financial service sector, and I spent two years myself at a big hedge fund in Connecticut. We looked at data from everywhere. I mean, I'm talking Google data. We looked at Palantir data.

And we made bets, currency bets and other things, based on the fact that we were able to collect data from, let's say, public and non-public sources around the world. If I'm able to see trends in a particular area, I'm able to actually make decisions. How do we predict or how do we know how many cars are going to be sold in Q2 of this year?

AUDIENCE: Registrations.

RICHARD KIVEL: Perhaps registrations. If I ask you, how do we know how many cars were sold in Q4 of last year, how do we know? Because what?

AUDIENCE: [INAUDIBLE]

RICHARD KIVEL: Yeah, but also financial reports. The CEO stood up at his annual meeting at the end of Q4 and said, we're very proud to announce that blah, blah, blah, and this number of SUVs versus this and profitability. It's almost ancient data at that point. It's completely useless. You cannot buy a stock based on how many cars GM, Ford, Tesla sold last quarter. Trailing data is useless.

What if I could use satellite information to actually see how many cars are being shipped out of Japan every single day of the year? Because I can tell you this, that if there's less ships leaving the port in Japan, that happens to be producing all of these Japanese cars as one example, or German cars, you name it. I can guarantee you that sales will be down next quarter. But nobody reports on this stuff.

Because the car dealers know things are slowing down. Interest rates have gone up. Perhaps consumers are being more conservative because we have inflation, so they're keeping their car a couple years longer. None of that shows up in the sales data today or yesterday. But if you're a car dealer, like a Herb Chambers, and you're looking at your 15 dealerships and you're looking out of your lot and you're seeing umpteen cars sitting there and you think to yourself, geez, in Q1 we would have sold this many, and in Q3 it went down, and in Q4, it went down a little bit. What the hell does that mean?

Well, they do not want Nissan to suddenly deliver them another 90 cars. So they call their Nissan rep and they say, we're going to cut it back to 40 this quarter. We'll push the old shit we have on the lot. But nobody in Wall Street knows that shit until the end of the quarter when the CEO comes out and says, we sold less cars. Can you imagine you're able to use satellite technology to actually track the number of ships carrying cars and actually predict the future? Now, that's a business model. That's the kind of stuff that data is able to do.

So when you think about your company, think about your business model, your first business model might be simple. You're shipping DVDs. You're selling this widget to companies that do presentations. You're selling this software to a logistics company, and that logistics company is going to increase productivity by 15%. But be prepared because your business model needs to change. You need to become more valuable to your client, more sticky, and more relevant all of the time.

So I'll stop there with those two examples. And then just let's talk about a few other industries. Real quick, stop for questions, feedback, comments, anything really crazy I said that doesn't make sense? All right, let's keep moving.

Let's talk about a couple of industries. And this goes, again, back to our original pie chart that came out of this great book that's part of this class, which is you've got these nine different things that you have to think about. And every industry is different. If you're in pharmaceutical, that's a hell of a lot different than the diagnostics industry. And if you're in the diagnostics space, it's a heck of a lot different than the medtech space.

The medtech people are basically selling medical technologies. It might be hips, it might be knees, it might be an instrument sitting on a desk. The diagnostic people are actually selling tests. The pharmaceutical people, whether they're biotech or pharma, if they're really core biotech, they're building stuff, and they don't sell anything. And then they're hoping that stuff at phase two or phase three gets acquired by pharma. And then pharma pushes it out to their massive sales teams. So each of those within the life science sector all have a different business model.

So one example I wanted to give is medtech. Because being at MIT, I spoke to one of the panelists that was up here earlier who's doing a company that is brand new company that's going to be spinning out of one of the labs here, Bob Langer's lab. And when you think about that new technology, right now, we're just trying to make proof of concept. But when it gets out into the market, how do you ultimately sell it is really critical.

Because in fields like medtech, health care, life sciences, you not only need to have the greatest whiz bang stuff, but you need to think about adoption. You need to think about how do I get the most influential prescribers, doctors, clinicians, surgeons, pediatricians, oncologists to do this and look at it and then tell their friends at the next conference they speak at that there's a new surgical instrument that they're using?

So in this world of medtech, as an example, and some of you all raised your hands earlier that you're in that field of life sciences, you have a problem that most other industries don't have. You need to be able to first make things work. Make sure that it's both efficacious and safe. It works, but it doesn't kill anybody. It's probably a good combination. But even though you have a great product that works and it didn't kill anybody, nobody might write a prescription for it. No doctor may ever even use it.

And depending what kind of doctors you're dealing with, holy shit, then your business model is even more challenged, because if you're dealing with surgeons, they're pretty cutting edge. They love the newest gadgets. If you're dealing with psychiatrists, probably not so quick to adopt new technology. They're still using DSM 5 to actually predict what the particular disorder is or disease that their patient has, and then they're prescribing very often off label drugs or drugs that are off patent. So you have different types of users. Those are the people you're selling to.

So you have to think about that. In the medtech world, your business model is absolutely critical, because not only do you have to make something that doesn't kill people or makes their life better and really works, but you also have to figure out how on Earth am I going to be able to pay for this? Are they going to be able to pay for it?

Is this going to be a direct to consumer, all of us open up our phone and we get advertisements for this gut microbiome test, and we get advertisement for something else? Know your ancestry and you'll be able to better manage your future health. Or if you're a person suffering with cardiovascular issues, you may see something on a commercial. But at the end of the day, if your doctor doesn't write a prescription for that new medication. It just doesn't sell.

So when you think about your business model, it's really important to think about who are the constituents I need to convince? It's not as easy as selling cool t-shirts on eBay or Amazon, where I'm just hoping it's cool enough that people will buy it. And if it doesn't, I don't really have a lot of overhead. It is a complex industry.

It's like selling SaaS platforms to the automotive industry. The automotive industry doesn't move very fast. It doesn't change very quickly. And because it's very big and powerful. It probably is hard to get an automotive company to put new technology into its system, because everything's working just the way it is. Yeah, we can make it a little more efficient, but we kind of like our procurement process the way it is. If you want to sell into that industry, you need to think about who are the constituents I'm selling it to.

Versus, let's say, an industry that is right at the cutting edge. Software companies that are looking to tweak the finest little bit of value out of how their disparate teams communicate. They're going to download that app. They're going to try it out. They're going to do things at a speed and a pace that you wouldn't normally expect.

The challenge is that there might be high switching cost. So you've got to challenge that. All of us today, we could sign up for an AT&T contract today and get our discounted iPhone and so forth. And then a year from now, we decide we're going to go to T-Mobile. Maybe we have to pay a fee. No stress. Keep your number. Go to T-Mobile. So that's high switching cost for the company, low switching costs for us.

And if I'm the one buying stuff, I like low switching costs. If I join this fancy Equinox fitness center and I'm not locked into a two year contract, and I can quickly move over to something else and go to LA Fitness, that's low switching costs for me. I like that. But for them it sucks, because they might have tremendous turnover. So you have to think about that as well. Who am I selling to? What is the differentiation? And how do I get them to keep coming back forever? Because for me to be competitive in my industry, I have to have no contract.

Think about some of these new mobile phone companies out there. Who can think about-- what are a couple of the names you hear that are some of these newfangled phone companies out there, one of which is represented by a very famous actor? Mint Mobile. And there's a few others. Consumer Cellular. Think about it. Does anybody here know who Mint Mobile uses for their entire network? T-Mobile. Why would that be? Think to yourself, holy shit, Mint Mobile is using the T-Mobile network. Why would they do that?

Because T-Mobile realized that there's a different level of consumer that might want the flexibility of bring your device, no contracts, short term contracts, super cheap on a monthly basis. But you're not going to be able to download as quickly as you want. There's going to be some restrictions around bandwidth. But your roommate, who's a T-Mobile customer, is probably paying $70 more a month, and they have ubiquitous connectivity.

That's a business model. Think about that. T-Mobile has a business model. AT&T has a business model. They're almost identical. Verizon has a business model. In the UK, my phone is a Virgin Mobile carrier. That's their business model. But T-Mobile said there's an entire part of the market that we cannot even touch, because the way we operate in the big stores is one year contracts, fancy phones. Lock your ass in, and we're going to charge you a fortune. And they got smart.

So what you think about is even companies that have a great business model that's succeeding, in order for them to capture an entirely new part of the market, they might have to reinvent themselves or they create a new brand that they own.

What's another example? Think about this in other industries, not tech, maybe tech, of brands you know that were known for one thing, perhaps, and now they've got multiple brands under the same umbrella to serve different consumers. What's an example? How about in the automotive industry? Who is it?

AUDIENCE: [INAUDIBLE] and Lexus primarily.

RICHARD KIVEL: And Toyota, right? Lexus and Toyota. So think about that. Toyota dominated forever, but it was considered the car you bought, middle of the road, safe, reliable. They knew they were never going to get the up and coming kick ass researcher who was making $50,000 a year and is now making 450 a year at Novartis. That dude, that woman, were not buying a Toyota. They were buying the Mercedes or they were buying something else, the Cadillac, whatever it was at the time. Toyota realized we have an entire part of the market that we cannot even reach, and they created Lexus.

Nissan. What did Nissan create? Infiniti. Same thing. What did Volkswagen create? Acura. Audi was an independent brand. They may own it now. Who the hell knows? They created Acura. What is it?

AUDIENCE: [INAUDIBLE]

RICHARD KIVEL: Oh, yes. You're right. Absolutely. Was it Audi? I thought Volkswagen created a different brand.

AUDIENCE: They bought [INAUDIBLE].

RICHARD KIVEL: Oh, that's right, they did. And that's just different. That's a consolidation in the industry. But when you think about some of these brands, think about brands that we all wear every day. Think about Ralph Lauren as a brand. What's under the umbrella of Ralph Lauren? What's at the high level and lowest level of Ralph Lauren? Does anybody know? Have you heard of the brand called Lauren? Google it.

Lauren is like their bespoke tailored $900 for a jacket Lauren. The next level down is Polo by Ralph Lauren. You know there's actually a level above Lauren? It's called a Purple Label. It is made to order couture level under Ralph Lauren. You know where it is all the way at the bottom? Polo Sport, which is still a great product.

But if you're just looking for a cheap sweatshirt or a zip up Polo Sport works great, and it's part of the Ralph Lauren brand. If you're at the next level, you're buying the cute little horse on your shirt, the $95, $110 zip up sweater with the horse. Polo by Ralph Lauren. You could buy a really nice jacket for $200. The next level, Lauren. The next level, Purple.

Think about that. They own your entire life. You became loyal to the brand when you were 17 years old and all you could afford was Polo Sport. You thought it was so cool. And now you're at the next level and you're still loyal to the brand. That's the beauty of companies that think about business model every single day and what is the market segment that we can capture next.

So let's move along a little bit. Digital commerce is always changing. I'm going to blast through these, because this stuff you guys know. But when I think about digital commerce, because it's changed so much, not only because bandwidth is increased, but now with the intervention of AI, which we'll talk about, you've got all of these new models that were created.

Think about Uber really owns no cars. Airbnb doesn't own any hotel rooms, but they have more rooms controlled than the top three hotel companies in the world combined. That sharing economy suddenly became very, very valuable. The personalized economy is pretty incredible too. It's I've got a subscription to this, and consumers say, you know what? Surprise me. I'll try that out. I'll take a shot, because I already subscribe to this particular brand. I'll try it.

Think about companies like Rent The Runway. I'll try it. I'll pay my subscription. I get this beautiful dress or five of them sent to me. I'll try it. If I don't like it, I just send it back. It's not the sharing economy, but it is this personalized economy. They know my style. I get it sent to me. Entirely different models, but they work so well. Certainly the replenishment economy is actually taking off more and more. And these are driven by the smart sensors in all of our lives.

These are the things that when you sign up for your Amazon account and you do an Amazon subscription, think about it, that's a replenish economy. I know that every 30 days, I need another box of Cascade for my dishwasher, or I need another something or other that will be delivered to me automatically. I don't have to think about it anymore. Refrigerators are now using RFID and all sorts of other tags where you're going to be able to barcode scan the things that are in your refrigerator. And when you're out, it just goes on to your shopping list.

It's the replenish economy. That's an entirely cool business model. Versus the I run out of shit and go to the supermarket economy, which is pretty much how I live still. I make a little list. Oh, shit, I'm out of those things again. I put it on the list. And then at the end of the week or month, I might go over to the supermarket and buy it. I'd much prefer it show up to my house.

So think about those little tweaks in business models really work, and certainly the do it for me service economy has exploded. Everything from, I mean, my shirts get dirty, I put them in a bag, I hang it outside my door. There's a little guy in a van shows up, boom, takes them twice a week and brings other stuff back.

But that has now accelerated into a lot of other industries where people are basically getting services that only the rich could afford 50 or 20 or 30 years ago. And now anybody can do it. Think about home cleaning services. I mean, when I was young, no one had a maid unless they were really, really rich. They had a cleaning person. Then all of a sudden, it became more and more common. And now every time I open up my phone, there's a new ad for some service, whether it be handyman or it be cleaning people. I can get my car waxed and detailed in my driveway.

So think about whatever you guys are building. How am I going to get to my consumer? Who do I have to convince? How do I scale? How do I change as times change? The hospitality industry, I think, is one of the most fun. For a gazillion years, we've all basically just used travel agents or we would go online and we'd book our trip. We'd go and search, what are the flights? What is this, what is that? Before you know it, we pull together our trip.

Nowadays, what you're seeing is these incredible technologies allowing us-- you can use ChatGPT and say, act as a travel agent. Design me a six day trip in Rome. I'm very interested in museums. I'm interested in science. I'm interested in academia. I am not interested in any family events, and I want it to be within this particular area. Boom. We have that in front of us.

So the travel industry has been transformed by technology, and now we're talking about things like co-robots in the future, renewable tourism events. What you also have is space tourism. Things that we never dreamed of before.

There's a company that I'm involved with that's in Spain that literally builds these massive, bigger than this room, giant monster helium balloons. And they have this capsule and it goes to whatever orbit it particularly goes to. You can see the entire curvature of the Earth. Who would have thought that would be a business model? But you have companies that are creating new technologies and new business models and becoming very, very successful because of the changes in that industry. And AI will change everything.

So I'm going to close with a few comments on this. When you think about AI, which I think is touching all of our lives, whether you're in medtech, you're in energy, think about this entire value chain. Most of us, including myself, when I think about AI, I think about NVIDIA. They're on the back end somewhere. And I'm using ChatGPT or I'm using someone else's GPT.

But when you're thinking about your company, where do you fit? If you're an AI company or you're just a company using AI to reach new markets, where do you fit? I mean, the data center infrastructure is a phenomenal area right now. And it's not just big data centers.

There's a company in Europe that we due diligence the hell out of. We ultimately passed on it. But they're building massive data centers in Norway. The weather there happens to be pretty cold and dark most of the year. A fantastic place to put a massive, five football field sized data center. Lots of land, very cool air, low cost from the standpoint of air conditioning.

So think about, hey, data centers, that's a business, but that's not a business model. Data centers in Norway using renewable energies with funding from the government, now we're starting to talk about a business model. And a contract with NVIDIA that gives us these particular computers that are able to actually process.

So think about where you want to be. Most people are actually at the app side. That's normally where I think of. As a consumer, what app can I use that's going to be powered by this infrastructure? So OpenAI we're all familiar with and Anthropic and Azure, and then you've got the cloud companies like AWS, all of which are the data center side. And then you've got all of the apps.

In fact, when you even go to the next level, if you take a look at AI tools and revenues, what you ultimately see is that here's just a snapshot. ChatGPT on the left all the way to Pictoria, Leonardo.AI.

I use this thing called Otter. Anybody ever hear of Otter? Isn't that the coolest thing? I'm telling you. I'm actually able to sit in meetings, and I'm in a lot of Zoom meetings, and actually pay attention. Whereas before I was listening, writing, listening, writing. I was trying to be my own scribe. Or I'd have someone from my office would dial into the meeting, and that was their job.

Now, otter.ai, Otter AI just joins the meeting. That's it, sits in the background, and it transcribes every single word that's being said in the meeting. And as soon as the voice of the person changes, it changes to speaker two, speaker four, speaker two, speaker seven. It's absolutely incredible. And then it uses AI. So it's not just a transcript. A transcript has limited value. I don't really want to read an hour long meeting transcript.

It then uses AI and it creates a summary for me, and then it creates an action item for me. So it can hypothesize from the meeting what actions were to be taken. PowerPoint presentation to be sent. Excel spreadsheet to be reviewed. Follow up email related to meeting in June. It's absolutely incredible. So on the app side, the opportunities are incredible. And being able to use and leverage AI is going to change your life.

So let me end with this, pitfalls. Don't overcomplicate things. Make sure that you really understand the market dynamics. I probably gave a lot of examples, whether it be medtech or others. And really be flexible. s companies that survive are the ones that see the future and they really think about changing. So you have to be adaptable. And thank you very much for listening.

[APPLAUSE]