“It needs innovation, creativity, entrepreneurialism, persistence”: David Chute of Ideas to Commercialization on scaling reading glasses distribution

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Ambika Samarthya-Howard: Can you introduce yourself and tell me a little bit about how you got into this field and what your journey has been?

David Chute: I've been an entrepreneur most of my life, and I’ve spent most of my career in the optical sector. At this stage of my life, I am semi-retired and my objective is to do as much good in the world as I can, with the least amount of time, solving big problems while working with great people, yet still having time for family, friends and my wife. How the heck did I get in the eye care industry? If I go way back a few billion years, I had an undergraduate degree in economics and a master's degree in economics from the London School of Economics and an MBA from the Business School at Stanford. I became a consultant with the Boston Consulting Group [BCG] and worked in Boston one summer, then the San Francisco office after business school, so I had a traditional MBA experience.

I worked at BCG for a couple of years and I found it fascinating. A couple of partners in the Menlo Park office spun out and formed a business to start businesses. It was a variation on the venture capital theme. This was the mid-80s. Venture capital was taking off. The personal computer was becoming a huge thing, VisiCalc and Lotus and Excel were becoming huge businesses, and it was all early stage. Sun Microsystems was beginning to take off. Innovation was everywhere, and the BCG partners said, "If we're as smart as business people, rather than billing out at $600 or $1,000 an hour, let's form companies based on either patents or novel business insights. Let's do the

market research, determine the need, write the business plan, hire the management team, raise money, launch it, and take founder's equity positions in each of those companies. Then, over ten years, we'll have equity in a portfolio of businesses that we started."

Ambika Samarthya-Howard: That's the definition of the model in some ways.

David Chute: The traditional venture capital firm, at this point, takes in a ton of other people's money and invests it in other people's business plans and other people do the work whereas we were more in the weeds, actually building the businesses.

I was a consultant, and half my time was spent on these really cool startups. One used laser disk storage technology to store digital songs and then record them on cassette tapes and do a digital analog conversion, so you could go into record stores and make a customized cassette tape. That eventually got spun off as a business. There was another company that used a material called nitinol, which is a shape memory alloy in a variety of product applications. You bend it, it stays bent, but if you heat it up, it goes back to the original shape. There were a dozen different possible product applications: electronic connectors, IV tube sets, underwire bras, braces, and eyeglass frames. I started researching a variety of these product applications to assess if there was a potential business there.

Ambika Samarthya-Howard: You were working exclusively with eyeglass frames—not the lenses, just frames, right?

David Chute: Yes, the frame itself. You have the metal eye wire that holds the lens and a bridge that connects the eyes, end piece, and the temples. Traditional metal is made out of softer materials, so you can manufacture it more easily, but if it gets bent, it can slide down the nose, sit unevenly, and the solder joints can break. We decided to use nitinol in the frame, so we could have frames that retained their shape. It was the world's most flexible metal at the time, around 1985 or so, and I was just a knucklehead consultant looking at this thing. There was a development contract with CooperVision to make a bunch of these first generation frames, which got me involved with the technology's application to frames.

Long story short, I became convinced that this was a really good application. I was given an equity interest in the patent position. After a few years of product development and buying two eyeglass frame companies on the East Coast and trying to turn the companies around and launch a first generation version of the technology, I eventually started a company to commercialize an advanced version of frames using nitinol. We had Japanese manufacturers that could actually make the parts out of the material. We had a patent. We had our patent, and there were some infringers. It's a long story– but we went to the frame companies in the US that were selling our product without a license, and we said, "Hey, we have a patent here. License this from us," and they said, "Come sue me."

That was the moment where I realized I could either go back into consulting and be on the traditional path, or I could be an entrepreneur, which I'd always wanted to do. So I said, "This is a business. I'll go start a company." I negotiated a license with the patent holder, who was the partner at BCG that formed this whole thing, and I started a business. This was the late 80s. I got $1 million in sales. I got POs [purchase orders] from Lenscrafters and Pearle and other optical chains. I hired a Japanese trading company to fund my receivables and guarantee payment to the Japanese frame factories. I shipped about a million dollars of frames made from this material.

The bridge of the frame was made out of nitinol. You could twist the frame front 180 degrees, and it automatically went back to shape. The temples were made out of nitinol. You could wrap the temple around your finger and it would unwind. We'd also figured out ways to fabricate them flat and to electroplate them so they looked like regular frames, but were super durable. You basically couldn't destroy them.

But because they held their shape, they also held your fit, so they were comfortable. They were also light weight and hypoallergenic. I eventually called the material Flexon. Frames made with Flexon have superior fit, comfort, and durability. It was a superior branded material ingredient strategy like NutraSweet, Teflon, Dolby, GORE-TEX. If you own frames made with Flexon, they're better. That was the positioning.

A privately held frame company called Marchon in Long Island, which had sales of about $50 or $60 million, was selling infringing versions of this product. They became convinced that this was the future. They negotiated a global exclusive marketing license with my partner, bought my company, "hired" me, and I began commuting to Long Island to transition my business to them. They had a hundred sales reps in the United States, and it was a growing company.

The timing was amazing because they needed me to build the technology and also to help them grow their business. For 13 years, I commuted every other week from California to Long Island. The Flexon technology became the largest technology frame brand ever. When I left Marchon 13 years later, Flexon was a hundred million dollar a year business (at wholesale), which was huge for that industry. The whole Marchon business went from $50 million when we licensed them the technology to $350 million when I left. I got to help run that business. We went from one country to 35 countries. We went from one sales force to three sales forces. We licensed Calvin Klein, Donna Karan, Nike, Disney, a bunch of other licenses. It was a great ride.

I left Marchon in 2003 and formed a company I called Ideas to Commercialization Ventures [i2C]. I recognized that all innovation, including in the optical industry, was a combination of a really great idea and excellent execution. You need both to innovate. And I realized that most of the inventors who have these great ideas are pretty horrible at business. Most of the companies that exist to replicate without error are organized to be efficient. They cut out expenses, they replicate products and services and try not to make mistakes. The last thing they want is something new to mess up their efficient machine.

These large companies tended to replicate new ideas, like spontaneous organ rejection. I'd been an entrepreneur, I'd built businesses, and at Marchon, I'd licensed technologies and innovated and started new businesses. I loved that. But I also worked with Nike and helped organize our company. I ran brand management and product for all brands. I loved that, too. So when I formed i2C, I figured, "I'll just hang out and work with inventors who have great ideas, and we'll develop prototypes and patents, and license them off, or start a company."

i2C became my business, and I'm still doing that today. Over time, I worked with inventors to develop new products, get patents, and license them. I would work with companies that had inventions, and we would spin out a division. I would work with an inventor who had an idea, and we would raise money and start the business. Recently, I worked with a Palo Alto inventor who had a light bulb moment. He said, "You never have your reading glasses, but you always have your smartphone. Why don't we put a reading glass on the back of a smartphone?" We formed a company and we did this. We created a little reading glass that goes on your smartphone, and it's always with you. That's ThinOptics, and we started it in 2010 or 2011. We went directly to the consumer, we set up a website, and it's still growing.

Over that period of time, I started and built a bunch of businesses. I was the CEO of several, and I licensed a number of others. In 2008, I had an invention that replaced an eye wire screw in metal frames, which have a tendency to fall out. It's a little cam thing that opens and closes, and I got the idea that maybe that could be useful in the developing world because you could easily open and close your metal frame, insert a lens, and dispense eyeglasses less expensively. I had no knowledge about uncorrected refractive error, and no knowledge about the need for reading glasses by the global poor.

I was at a party with the COO of Yahoo. I was telling my friend about this idea, and he said, "You've got to talk to my friend Jordan Kassalow. He's an optometrist in Manhattan, and he's got a not-for-profit that brings affordable eyewear to people in the developing world." I didn't know anything about this, but I went to New York and met with Jordan. Neil Blumenthal, who was the COO, and who later became the founder of Warby Parker, was in the meeting, and they told me they had hundreds of vision entrepreneurs who work in Bangladesh and India, trying to sell reading glasses in their villages. I just fell in love with Jordan and Neil and VisionSpring. It wasn't VisionSpring at the time, it was another name. I said, "Forget my technology. What you guys are doing is great." He invited me to join the board, and within a month, I also joined RestoringVision with my friend Reade Fahs.

Ambika Samarthya-Howard: RestoringVision and VisionSpring are two very different models. How did you end up doing both?

David Chute: Yes, they're very different models. The optical frame industry is a small industry. At one point in the mid 1990s, I wanted to advertise Flexon on TV, so I negotiated a $3 million,

6-week cable TV program with Lenscrafters. One of the marketing guys on that program was Reade Fahs. Flash forward to 2008: Reade was the CEO of an optical chain, and he had a lot of interest in solving uncorrected refractive error. He knew Mark Sachs because they'd been in Albania together, at an eye care camp. I joined VisionSpring a month before Reade, and then he joined RestoringVision the month before me. In both cases, we were the first business guys on both boards.

 What I realized was there's no difference between me forming a prototype, getting a patent, and licensing it, or building a new for-profit business and doing the mission of a social enterprise. There are no stock prices or profits to maximize, but you're trying to maximize the number of people you can help see with a scarce resource of donor funds. You're asking, "How do you become sustainable? How do you scale growth? And how do you become efficient and decide which consumer segments to go after?"

I joined both boards and realized early on that the disciplines that have been developed in the for-profit world, like maximizing an objective subject to scarce resources, applies to both not for profit business models. They have different constraints, but it still applies. An entrepreneurial growth mentality also applies. At the time, in 2008, I think the collective number of reading glasses distributed by both organizations cumulatively was 250,000 to 300,000 in that year.

 RestoringVision was larger at the time. VisionSpring was smaller but more involved in developing the market. VisionSpring was much more vertically integrated, trying to control distribution and buy the frames, whereas RestoringVision was getting excess inventory from reading glasses companies then distributing them through groups going on mission trips. It was less ownership of assets and bricks and mortar and more like an Uber trying to use other people's assets to efficiently shift the inventory from the developed world into the developing world, acting like the low-cost switch to make that happen. VisionSpring was trying to build a sales team and a distribution team, which is hard and more expensive.

In any event, I think between the two of them, they did maybe 300,000 units in 2008, and the cumulative number of people they helped at the time was maybe a million people. They were small startups, and at the time, nobody even understood that this was a problem. I remember Jordan talking about George Soros writing the first check, and people saying, "Wait a minute. People can't see because they don't have access to glasses? Glasses are everywhere. How can that be an issue?" People could not even conceive that it's a problem. RestoringVision distributed about 200,000 readers that year, which was great for Mark Sachs, who was operating out of his garage. He got this idea in an eye care camp.

On the other hand, for 800 million people, a few hundred thousand readers is not even scratching the surface. At that moment I said, "All right. I'm going to keep doing my for-profit stuff. But what

I've learned in my career about building businesses completely applies here, and it can be super beneficial without taking a lot of time." I put a lot of time into it, but it can be super leveraged.

I love the people in both organizations. I love the mission. I even went on mission trips in India and El Salvador. It changes you when you see the impact. Mark told a story of a grandmother whose daughter and son had died, and so her granddaughter lived with her. Her sole source of income was sewing clothing, but she couldn't thread the needle, so she kept her granddaughter back from school to thread the needle. Without an education, that little girl would have limited options in life. Then the grandmother got reading glasses and the granddaughter could go to school again. It just changes lives. I felt I had to do this work.

We grew exponentially over that 16-year period. Then I met James Chen through a venture capitalist mutual friend. He's a billionaire philanthropist based in England, who, on his own journey, became aware that uncorrected refractive error was a huge, invisible, global problem. His family had made a bunch of money in pots and pans in West Africa, and he ran a foundation around this. He's the nicest guy. He attacked the problem initially by saying, "I'm going to go into Rwanda and we're going to refract everybody in Rwanda. We're going to work with the Ministry of Health and get their community health workers and their nurses to do refractions." He had invested in some adjustable power lens technologies he thought could solve the problem.

 Around 2017, he pulled a bunch of people together in Murano, who were not necessarily in eyecare but who had experience in creating massive global change, to brainstorm how to bring this problem into broader global awareness. He got the Commonwealth Heads of Governments and the United Nations aware of this problem. He helped fund randomized control trials for the tea pickers in Assam. Over time, we scaled both VisionSpring and RestoringVision. We negotiated one million and two million units a year donations from Foster Grant, and we negotiated relationships with large in-country distribution partners. We figured out the best way to distribute in Bangladesh and India. We got huge donations from Mackenzie-Scott, Bezos, and other entrepreneurs who made $4 million anonymous pledges. We started working with the Livelihood Impact Fund [LIF].

Now, we're at a point where we can say, "Hey, the problem of 800 million people who can't see because of lack of access to reading glasses is an affordable, solvable problem." The technology exists, and it's absolutely doable. We're not waiting for the FDA to approve a new drug or device, or for some scientist to invent something. What we need to figure out is, if we intervene in a massive way, how do we know we're not setting back the natural forces of the market to supply readers? Or how do I know, once I give out readers, whether somebody uses it or whether they change their behavior? How do I know if they will buy a second pair or not?

The organizations that can do the implementation, the RestoringVisions and the VisionSprings, have gone from embryonic to scalable, and they're working on different channels of distribution in

different markets that are in different stages of development. There are different ways to refract people, and there are lots of different experiments and efficiency projects happening.

 The biggest barrier to massive impact has been funding, and now we have funders who are beginning to see that, in terms of their mission, it's in their interest to improve livelihoods to fund this stuff. You can't have poverty alleviation if you can't see, and you can't have women's empowerment if the woman can't see, and you can't have education if the kids can't see. Clear vision becomes an enabling technology to allow these other human aspirations to occur. You unleash the human intellect because the person can now see clearly, or drive safely, or learn.

Ambika Samarthya-Howard: You've done a lot of pharmacy development in the developed world, and that's where most people here get glasses. What are your ideas for trying to bring that model to the developing world? What role do you see pharmacists playing in that model?

David Chute: Great question. Let me backup for just a second and do a thought experiment and then get to your question. Out of eight billion people on the planet, three billion live on less than $2 a day. Another couple of billion live on, I don't know, less than $5 or $6 or $7 a day. A huge amount of the population doesn't have a lot of income, but you need discretionary income to be able to buy something like glasses, so the less money you have, the harder it is; that's number one.

 Number two is population density. If you have a lot of people in a geographically compact space, the cost of getting a product to them is relatively low for obvious reasons. If there are 200 people living in the southern part of Sudan where there are no roads, the cost of getting that product to them is super high. You can think about every market, and by market I mean a geographic space where physical things get bought and sold, as being a combination of population density and income per capita. That combination affects the infrastructure of retail.

You might have a general goods food store in a small village someplace, whereas in Delhi, you're going to have all of the retail infrastructure you have in Manhattan. If you think about the distribution of reading glasses in every market on the planet, you're going to have different stages of market development. You have no-market rural, agrarian societies with no income per capita, and you have very mature markets in the Manhattans, where you've got a lot of money, dense distribution, and things like pharmacies. And you have multiple stages of market development along the way.

 In some of the lower-income, lower-population-density markets, the only way to distribute readers is through episodic eye care camps. You can't really afford to have fixed physical distribution. In slightly larger markets with more population, and maybe a little bit more income and some light industry or craft work, you'll have clinics and hospitals. You'll have community

healthcare workers, and maybe you can have distribution of reading glasses in hospitals where you have cataract patients and medical patients coming through, so you can sell them.

If you go further up in terms of market size, you may have street vendors in the informal economy, where you have people putting out sheets and blankets and selling reading glasses on the street. Eventually, you'll get to larger markets, and people who have a little more income. You might begin to have specialty retailers selling glasses, places where the richer people come and buy, like Lenskart in India. Maybe they'll start coming down to the C-level cities. At some point, there are a lot of pharmacies. Some might only sell soaps and toothpaste, and then as the markets get more evolved and generate more income, they'll start to sell more personal care and beauty products.

 Pharmacies start to become a logical physical distribution mechanism because their tentacles go into so many communities, many of which are failed or emerging reading glass markets, but they offer the prospect of being points of distribution. The problem with pharmacies broadly is that, with reading glasses, you need at least five optical powers for each style, size and color and a large product assortment takes up a lot of physical retail space. If I need a different style for men or women, or for fuller or narrower faces or different colors for fashion, pretty soon, the SKU count of my product assortment goes through the roof, so I need a lot of physical space to show those products.

When they sell off, how do I get those reordered and delivered and put back on the display? If somebody pulls off the bestsellers, the sell-through goes down until the best seller gets replenished, so I need somebody to manage the display space. Now, I have a lot of space that could have been taken up by bar soap or toothpaste or shampoo, and that requires a lot of merchandise management. I have a supply chain problem. If I have a population that can't pay a lot of money for the item, and it costs me a lot of money to get it there, the margin that the pharmacy makes is going to be lower, or the turn might be lower than if the alternative was soaps, toothpaste, or cold medicines. The challenge becomes the economics of the product line for the pharmacy. What markets is it going to work in versus not work in?

Ambika Samarthya-Howard: Where would you place your big bets? If pharmacies are not going to be the end goal—and all the reasons you're saying are a hundred percent correct—then what do you think is the best way to scale this?

David Chute: Staying macro for just a second, I did a study for VisionSpring in 2018 and I said, "If you stepped back and did a thought experiment and thought about every market in the world, primarily developing world markets, as being some combination of population density, income per capita, and retail infrastructure, you could then identify the markets by stage of reading glass market development." In the most embryonic of those markets of a hundred people who need reading glasses, maybe none of them have reading glasses, so you're at 0% penetration of your available market.

Whatever your retail, be it shoes, food stores, grain stores, it is growing to sell stuff. It isn't just you show up in the market, lay out, and sell your rutabagas. If you think about the small agrarian village with just farmers and day laborers, where one hundred people need reading glasses, zero of them probably have the product, or maybe one or two because they got it from an uncle.

If you flash forward to the other end of the spectrum, it's Manhattan and 98% of the people that need reading glasses have reading glasses. Then, you probably get a curve that goes like this: it grows slowly in your emerging markets, hits an inflection point, and then goes asymptotic towards one hundred percent. Then, if you think about the markets at different stages of development, you might only have episodic eye care camps in some markets, emerging distribution in hospitals in other markets, the prospect of having specialty retail eye care shops in other markets, and the prospect of having pharmacies in still other markets.

The message to VisionSpring was, let's intervene at a point where the inflection point is starting to take off. We have the highest likelihood of stimulating a for-profit response, we get the biggest uptake, and we configure ourselves based upon the stage of development of the market. If you're in an agricultural zone, you want your agricultural workers to pick the tea leaves. If you're in an apparel manufacturing zone, you want your workers to be able to do their work, so you do factory screenings and align yourself with local retail. If you have community healthcare workers and they're doing episodic camps, then they can drive people into the hospital and set up a dispensary. There's logic as to when and where you intervene. That's the macro overlay.

On the pharmacy side of things, there are a lot of reasons to believe that pharmacy distribution can fail in these low-income, low-population density markets. In terms of my own analysis for the Livelihood Impact Fund, Part A was factual, empirically-based: what's going on, what's worked, what hasn't worked. Part B was innovating like I did in the for-profit world and figuring out the right product assortment, the right display, the right location in the pharmacy, the right supply chain replenishment and merchandising system to deliver the retailer a product line that will generate as much profit per foot of shelf space as any alternative they might have, ensuring it is in their best interest to carry it. Then, it was put in markets where there's enough concentration of demand that the consumers will buy it, and it is sustainable. So the trick is to be entrepreneurial, creative and test different configurations of assortments, in-store POP [point of purchase] and merchandising.

I sold our ThinOptics reading glasses at CVS. We were testing in about 250 locations. They had a 24-week program where they analyzed sell-through per store per week with a million data points on who was buying it, where the store was located, where the product was in the store, what the display looked like. For instance, was it in the middle of an aisle or on an end-cap? You learn that there's no binary answer about success or failure. It works in some cases, and it doesn't work in others. If we were on an end-cap near where they dispense prescriptions, our sales were great. If we were in the middle of an aisle in a non-through aisle, our sales were dead. If we were in a rural

store, we didn't sell well. If we were in an urban or suburban high-income environment, we had great sales. So results varied widely, which has implications for distribution in the developing world. For the developing world, we will want to engineer the best possible combination of assortment, display, merchandising, store location, location in-store.

If I had a display that did really well for the first month or so, and then sales fell off, the problem could be that the display wasn't getting replenished with the bestsellers. The bestsellers would sell off, they'd be gone, and sell-through would drop off. Engineering the right customer journey and engineering the right merchandising, supply chain and replenishment journey for the retailer will be absolutely critical for success in the developing world. The study for LIF has to have an analytic component that is augmented by an entrepreneurial, test and learn, creative component. We need to make retail distribution work in markets and stores where it can be made to work. We may need to avoid markets where the constraints to sell in and sell through are too great to overcome. Passive analysis is not enough.

 We also need to be innovative around the entire approach to how we go to market. It starts with asking, "What's the right product assortment?" Maybe I don't have as many styles and powers, or maybe I have a much tighter and more narrow display and there's less choice, but that's okay, because it's taking up less linear feet in the pharmacy. Then, the consumer has to pay X, the pharmacist has to pay Y, the margin has to be whatever it needs to be to make it a viable retail category, and the turn has to be however many units per store per month or week to make it a profitable product line to carry and scale.

Once we've 'engineered' the right solution, we have to make it a comprehensive, turnkey system. In some cases it won't work perfectly out of the box, so we will have to tweak it until finally, you can say, "I got it. This is retail merchandising package A for these kinds of stores in these kinds of markets. This is retail package B for those kinds of stores in those kinds of markets. We have an 80% or 90% chance of a sufficiently high rate of sale that the pharmacist, in their own best interest, will keep it there." The manager will keep it there, the owner will keep it there, and now these kinds of markets will be viable points of distribution for pharmacies, so we can accelerate market formation that might not have happened otherwise.

 If you can combine good retail distribution and merchandising with that with some kind of demand creation, either ads or screening of factory workers, we can augment in-store sales and marketing with grassroots marketing and word of mouth. It's important to understand customer acquisition cost in order to understand what forms of marketing, advertising and PR you can afford to build demand faster than would have happened normally. By understanding the macro environment, such as the consumer's ability to pay, the status of retail infrastructure, the cost to supply, the consumer's discretionary income, and then figuring out how to make retail distribution work on a micro basis, then you have the beginning of a comprehensive

go to market plan that can ‘turn on’ reader demand and supply into a sustainable and scalable proposition. You can maximize the opportunity to accelerate the formation of for-profit markets wherever it's enabled to occur rather than just wait for it to happen. That kind of intentional thinking and competent execution, along with Livelihood Impact Fund funding, can maximize reader market development effectiveness.

A thorough understanding of the different stages of market development and what can and can’t be done in terms of in-store distribution will allow us to say, "Go to this market in this way; but don’t ever go to that market as long as these conditions exist." Or, "Do it with governments, because we can’t overcome market failure” or “Do it through episodic eye care camps," or whatever we think a certain region needs. The macro attack on the 800 million people can be logically conceived and thought through via testing and learning, scaling when it works, abandoning it when it doesn't. Then, eventually, the for-profit world will take over where it can, and governments hopefully will recognize that where markets fail and can't be revived, it's in their best interest to have citizens who can see clearly. Ideally, (better) governments will intervene and say, "It's a public good for my population to be able to read and see, and so I'll subsidize that or I'll pay for that.” Then you get this patchwork quilt of solving the problem. That's the vision.

Ambika Samarthya-Howard: I know RestoringVision does a lot of direct work with governments and government consortiums, and VisionSpring does a lot of work with community health workers. In your experience working with both, what happens when you are in a space that is rural, and you know that pharmacies are not working? What is generally your first go-to to try next?

 **David Chute:** I think there are limited benefits to aging, but one of the benefits is you can use your own memory and think back over the last 20 to 30 years. What I find is that humankind's view of this as a problem is evolving, and governments’ recognition that there may be a role for them to play is evolving, and charities are evolving. So I think the answer is an evolving one. I think governments need a lot of prodding to get into this area. If you have infectious diseases or malaria or river blindness or cataracts, or solvable blindness types of issues, it is a no-brainer for the government to get involved. It's a little more subtle and nuanced around reading glasses.

There’s still an attitude of "Shouldn't you pay for it yourself?" or, "Is that really a problem?" I think there's an educational component that is very important. Ella [Gudwin] at VisionSpring has found that particular states within India, like Telangana, completely embrace this as an issue area. Maybe the finance minister realized it's great for tax revenue, or maybe the politicians realized it's great for getting votes, or maybe they just truly want to do the right thing for their people, but there are other governments that don't do the same.

It's not always the case that the government's going to step in. At the same time, both RestoringVision and VisionSpring have optometrists going on mission trips, churches going on

mission trips, philanthropists and doctors going on mission trips, and these people will frequently go into rural areas where there are no services and they'll do episodic eye care camps. Or a Self-Employed Women's Association, SEWA, who is focused on women's empowerment, may realize, "Well, we need to go into a 2000-person village and help the women there get glasses, so they can do tailoring and seamstress work and earn an income and be empowered."

 In answer to your question, in the very low population density, very low income per capita market areas, for profit distribution won't work and distribution will depend upon subsidized product and distribution. Can the government come in? Can charitable, episodic eye care camps come in? Can you get some local community healthcare workers to come in? Can you set something up? If it's a permanent distribution, maybe in a hospital or a healthcare clinic, it's hard. It's going to depend upon the country and the state of economic development. Vietnam is probably going to be easier than rural Sudan because it has higher income per capita and more light-duty manufacturing, whereas rural Sudan doesn't have any of that, so it's going to be super hard in rural Sudan.

I think the macro, income per capita, population density, and retail infrastructure approach begins to suggest the solutions and then the micro work– adapting the solutions to the country, the government, the players, the specifics of getting reading glasses in volume into those markets– will be thoughtful, creative and tactical. In my own business career, I've definitely evolved from what I call the Normandy invasion approach of, "I know in 12 months I'm going to launch something, so I'm spending all this money hiring sales reps and getting sample bags and displays and counters cards. I don't know if it's going to work until I fire the gun, and it could be a giant smoking crater if it doesn't," to a more "test and learn" approach, and that's the approach here. It's more of a let me get a little bit, sell a little bit, adjust, modify, iterate, tweak, process. Then, when it works, scale it like crazy. We're a little more in the test-and-learn mode with RestoringVision and VisionSpring and also LIF. But once we know that it's working and we're not squandering charitable dollars, then we spend the money and grow the business.

Ambika Samarthya-Howard: What is the role of technology within all this? I've spoken to about 30 to 35 people in this space, and I think only one has talked about trying to figure out an iPhone app or how we can do the screenings better. Do you think there is a role for technology here, and why do you think technology is not playing more of a role right now?

 **David Chute:** Technology can and should play a role. Certainly, on the manufacturing side, the beautiful thing about reading glasses is you can make a million of them. You just set up your assembly line, you run a couple of shifts and you're producing long production runs at low cost. If it's injection molded, the cost of long production runs drops like a rock. Standard eyeglass frames are custom-made with lens production and insertion, so it's harder to pick up long production run

economics. There's some technology in manufacturing, particularly with long production runs that drop costs. You don't really know it, but it's out there in the background.

 Andrew [Bastawrous] at Peak [Vision] is using smartphone-based apps to reduce the reliance on expensive, scarce trained professionals. The more we can 'deprofessionalize' obtaining accurate refractions, the better because it reduces costs and extends reach. I think that's great. You don't want a seven-year, post-grad educated ophthalmologist in the middle of Sudan to refract eyes to hand out a pair of reading glasses. You want the least trained paraprofessional possible, and you want to eliminate them if possible, to cut out as much friction as you can to get the consumer the eyewear they need. Anything that helps deconstruct what's necessary to get eyewear on faces, you want to use.

 Now, you don't want to miss the fact that a person has cataracts or glaucoma, and if they do, you need to get them into a facility where they can be taken care of, so you need referral mechanisms, but you don't want to have ridiculous levels of overhead when assessing vision correction needs and dispensing readers. Apps like Peak's, and anything that can make refraction happen more quickly, are great. Near-vision reading tests are pretty easy to do, and there's definitely some technology there.

 This isn't quite technology, but Jordan [Kassalow] and I have been debating whether instead of having five or ten powers per style, size, and color of a frame, can we have two? Can we pick two diopters? Plus one and a half, plus two and a half? This is geeking out a little bit. It's not ideal, but it could be good enough. By dramatically reducing the SKU count and product assortment, we may be able to shift readers into being profitable when sold through pharmacies where it would not have been that way otherwise. Then, that opens up a hundred thousand doors for distribution that wouldn't have otherwise been available.

There's also a class of readers that have variable power—and this is truly revolutionary technology. They look like regular reading glasses, but they're not because they have two lenses per eye. The back lens slides relative to the front lens that's mounted in the frame. This is called an Alvarez lens. When the lenses are adjusted to the inside, the ADD power is +3.0D. When the lenses are adjusted to the outside, the ADD power is +1.0D. The intermediate positions cover everything between +1.0D to +3.0D, which is pretty much everything you need in reading glasses. That means that the user can self-adjust and the retailer only has one SKU per style, size and color, not five or ten. It's an 80% reduction in SKUs, which is an incredible benefit.

Now, there are some manufacturing economic issues around the current style that would make them too expensive for the developing world. But the current style can be designed for low cost production so, the cost will drop like a rock with volume production. James Chen, who I mentioned earlier, has a company that does this. In parallel, I'm working with James and Adlens to

try to figure out if we can design this to get the costs down. We have to get the ergonomics right and the style right so it becomes part of the solution for pharmacy distribution in the developing world. If not, I'll work with Jordan, and we'll try to make the two powers, not the five powers, work. Technology will play a role for sure in the other elements, like the replenishment systems and the app-based refraction systems.

 If you think about it in broad strokes, the issue really isn't a product issue because the product exists, the product problem is solved. It's just lenses, and it's been around for hundreds of years. It's a sales and distribution issue and an affordability issue. You still need to crack the code, solve the problem, make sure the consumer journey works, and ensure that distributors and retailers can make a profit and that the supply chain is efficient and low cost. You combine these things, and you ultimately get the total delivered cost less than what the consumer can pay, with an adequate profit margin that's equivalent to alternative products that the retailer would sell. When you get that engineered into the system, it all works. If you need to subsidize it a little bit because the consumer can't afford to pay what you need to get the profit, maybe you can engineer the government to come in and subsidize it.

When a consumer is exposed to a new product, if it's a good product, their habits will change and they will never be able to live without that product again, so their repeat purchase rate goes up. Their referral rate, which is when they tell their friends about it, goes up. They tell five people, then, humans being humans, those five people think, "If all the smart people over 40 in my village are wearing these glasses, it's aesthetically acceptable, and I can look smart and admirable by wearing them." Soon 80% or 90% of the people that need glasses start wearing them. Human behavior changes because the vanity is in place and the need is in place. People will readjust the hierarchy of what they spend discretionary income on to afford it.

If I'm a seamstress or a tailor, and my income depends upon my ability to see clearly, I'm definitely going to prioritize buying readers. If I'm living with a smartphone and I can't read my smartphone, I need reading glasses. All these different pieces come into play: consumer demand, consumer behavior, pricing, price elasticity, supply, retail infrastructure and when they line up properly, markets work. In my case, I've done the BCG economic thing, that's the macro piece. I've built frames and reading glasses distribution, that's the entrepreneurial piece. I've worked with VisionSpring and RestoringVision for 15, 16 years. Now, with all that experience, this becomes a very solvable problem. It needs analysis, empiricism, and fact-based truth. It needs innovation, creativity, entrepreneurialism, persistence, and an attitude that you will beat your head against the wall, go around the wall, over the wall under the wall, blow up the wall, and do whatever it takes to eventually solve the problem and make it happen.

 In some cases where markets aren't going to work, then the only answer is to rely on the government. Maybe it's lobbying the government and telling them why it's in their best interest to subsidize or make this happen. It's telling members of government why clear vision for their

citizenry is in their own best interest. I'm super optimistic. This is all solvable stuff. It's a big problem that's got to get fixed, but it's all solvable.

Ambika Samarthya-Howard: You're significantly on the way there in terms of scaling pilots and being with the right players and trying the right things. I feel like we're really close.

David Chute: Livelihood Impact Fund sees that human livelihoods can be improved, and that's their mission. They're getting the right people on the bus to solve the problem, and they're systematically chipping away at the problem. When you get the right people and the right organizations, and you get the right solutions, good stuff happens. I think that's the path that we're on right now. It's good people, smart people, intelligent problem-solving, and resources; it's all there, and all very fixable.

I want to note that there's so much financial incentive for modern news networks, cable news, TV news, and social media to talk about bad news and to talk about why you should be pissed off, and we're just inundated all the time with negative, negative, negative. If you ask the average person, they think, "The world is horrible." But there's so much good stuff going on in the world. Everything happening in this sector is changing lives big time. It is really good news, it just doesn't get out there and I wish more of it would. Mankind has never been better off.

Ambika Samarthya-Howard: We're working on that, and I think we're making headway, so I appreciate your contribution. Thank you so much for your time, David.

ICON LEGEND

Ambika Samarthya-Howard (she/her) is Solutions Journalism Network's Chief Innovation Officer. She strategizes on communications, metrics, impact, product and technology, leveraging platforms for the network and creating cool content. She also leads the Solutions Insights Lab, an initiative of SJN that uses targeted research and analysis to identify and interrogate what's working and what's not in a particular sector or field. She has an MFA from Columbia's film program and has been creating, teaching and writing at the intersection of storytelling and social good for two decades. She has produced content for Current TV, UNICEF, Havas, United Nations Population Fund (UNFPA) and Prism.

** This interview has been edited and condensed.*