

Philip you often talk about the term data supply chain can you explain to viewers what you mean without sure so if you think about financial institutions across the spectrum by size sell-side research advisory they all do different things in the market but underlying they have the same what I would call manufacturing process core manufacturing process which is to take in information about the world about markets about economies data and then do analysis on that information on that data and try to arrive at some hopefully unique and valuable insight and that insight can then be used to power different actions in the market actions place a trade by a company rebalance a portfolio pitch a client author a research report etc different actions but all driven by this same underlying process of taking in data and doing analysis on top of it to arrive at some valuable insight and so if you think about that as the core manufacturing process of a financial firm then all the data that's going into it is the raw material it is their supply chain and I think to date we can safely say that firms have taken what we might call a sort of hunter-gatherer approach to that data there's a lot of scrounging around say all we need some of this data we need some of that where can we get that let's get that pull that in and wire that up and it's been a little bit on the fly it's worked you know and firms have certainly seen tremendous value out of the data and but we believe that just in the same way that manufacturing over a hundred years ago 200 years ago moved into a more sophisticated supply chain view of the world sort of thinking about their raw materials in a much more repeatable way and thinking about how to have a supply chain that is that is more automated that's more auditable and so we believe that financially dependent firms sorry informationally dependent firms like financial institutions need to think about the data they consume in the same way as manufacturers think about their parts. So, we believe that firms need to move towards a supply chain view of the world and think about a much more sophisticated way about where are they going to source data from how are they going to get that data in in a very efficient way at scale in ways are very resilient and robust and that they can rely on and just bring a higher level of sophistication to that process. And one of the reasons that we we use this analogy is we we see crux as playing the role of a logistics firm in the same way that a logistics firm in the manufacturing world transports raw materials, stores materials, potentially repackages those materials for a manufacturer to basically make their supply chain work as well as help them identify potential suppliers in the supply chain. We do the same thing with information. So, we don't provide the data ourselves, we don't sell the data but we wire it up we transport it. We store it and we repackage it in ways that make it as valuable and usable by the financial institution as possible. You used to run a large data business what were the difficulties you faced in your experience getting that data to the buy side? I ran several different data businesses and there are tremendous issues in both the consumption side and in the

redistribution side. And frankly, that was you know one of the driving ideas behind Crux. It's an idea I've been thinking about for over 10 years being a supplier of data to customers I saw that we could do all this work to package up the data aggregate it and then drop it on the client and the client still had a huge amount of work to do all the data engineering to actually bring it in-house and make use of it. And it occurred to me some time ago that there really was an opportunity for somebody to come and help clients who are all doing this on their own and all doing it independently. Everyone was doing the exact same work of wiring up the downloading identical copies of the data storing identical copies of the data, all cleaning the data. Because no matter how well we thought we cleaned it it needed further cleaning they're all doing it again and again and again and I thought gosh it really needs to be a utility for the industry that comes in and helps these firms wire up to their data sources that's neutral not a data vendor themselves but helps wire them up and helps make sure that those supply chains are flowing very efficiently and they can get economies of scale rather than everyone doing this themselves. How do you think larger players will react to what Crux has done. Well, what we've seen is a very positive reaction and you know we've been backed by some of the largest sell side and buy side institutions and we don't disclose who our customers are this question is a key part of our of our business value set but Two Sigma has publicly announced that they are a customer of ours as well as being an investor and a strategic partner in terms of experience sharing and you know they see tremendous value they believe that the world is moving towards more of a supply chain approach to the consumption of data and the future of data is a much more efficient model and repeatable model and one that has scale economies in it compared to what's been done in the past. How big as the addressable market? We think it's it's huge. As you can imagine, every firm is taking in large amounts of data there's a huge variability but everyone is really dependent on getting data and the hunger among firms for more and more and more data is only increasing so the ability to get more data faster more cheaply and extremely reliably is very valuable. Firms that can get their hands on lots of data try out lots of data back test it and put it into production quickly and start generating returns off of data that fits their mandate quickly gives them an edge that's a huge edge in the marketplace and that's what we're delivering to our clients