[Nataly Arber] Welcome to the first episode of Shaping Global Markets presented by DFIN. My name is Nataly Arber and I'm thrilled to bring you a series focused on key topics driving the regulatory and financial technology space forward. Every episode, I'll be joined by industry experts who will share their unique perspectives and personal philosophies that have shaped their careers and their vision for the future of the industry.

[Music Interlude]

[Nataly Arber] In this episode, we uncover what makes data governance and standardization so critical to addressing your data quality needs. We'll also talk about the best way to spend your lunch hour according to our esteemed guests. I'm pleased to welcome Naveed Asem, chief data and analytics officer at DFIN. Now, let's dive in and learn about AI, machine learning, data, mindfulness, and more.

Hi Naveed, thanks so much for joining me.

[Naveed Asem] Thank you for having me here, talking about some of these ideas around data.

[Nataly Arber] Yes, thank you so much for being here Naveed. It's so exciting to have a chance to speak with you. I'm going to start with a little bit about what you've experienced throughout your career. What do you think is most critical for companies today in their data governance and standardization efforts?

[Naveed Asem] Yeah, so to answer that question you have to understand why do companies do data governance and standardization. And the main goal around that is things like twisted decision-making. So, if I'm a company, and I'm going to be buying another company or making decisions on mergers and acquisitions, I want to make sure that I'm making decisions based on data that is trustworthy. The other aspect of that is where you may be giving your data or exchanging it with other trusted partners.

When we go to regulatory bodies, and we are giving them data on behalf of our customers, our customers trust us with their data, and the SEC is expecting a level of trust on the data itself. As the middleman, at that point, we are making sure that the data is of high quality.

So, the most critical component in data governance programs and data standardization is:

- Ensuring that the quality of data is fairly high
- And ensuring that the quality of data stays high throughout the entire program

[Nataly Arber] And is there anything that companies who are just in the beginning stages of addressing their data quality issues, that may not have certain skillsets that might be beneficial to them, what can they do as a first step to start a data governance program?

[Naveed Asem] I love that question, mostly because it's also a coaching opportunity for me. So, first, we have to understand that the data quality problem, or the issues with data quality, is a pervasive problem. Basically, all organizations, small or large, they have it. And just to quote a few things, Gartner published an article that said, poor quality of data is costing companies 14 million dollars per year. And this is not even the complete picture because these are only the companies that know they're losing that much money. There are a lot of companies out there that don't even know how pervasive data quality problem is; they don't even know how much revenue they're losing. So, it could be upwards of 50, 60, even hundreds of millions of dollars per year! So it's a fairly big problem.

The other thing I'll quote is a Forrester example. They published research where they said, one-third of analysts, like data analysts, they spend half of their time just massaging the data, cleaning the data up.

So, think about it this way, if you hire a data analyst and their job is to give you insights on data, they're spending half of their day, cleaning up the data. So, it's a fairly pervasive problem.

So, the first step that I tell companies, or any organization, if you're going to start on a journey to improve your data quality, you have to first admit that there is a problem with data quality. Once you understand

that, then you have to understand how big of a problem it is. You have to be able to walk into your chief financial officer's office, CFO, and tell them that today poor data quality is costing you X number of dollars. If you say it's five million dollars, and then you have to be able to tell them that you have an opportunity to reduce that expense by 50 percent, by running a data quality program. So, that is the first step – making sure you understand how big of a problem it is.

Once you understand that [problem], then you basically start working on defining the data lifecycle. How is your company collecting data from different sources? Typically, companies may collect data from as much as 13, 14, 15 different data sources, and you have to understand the data lifecycle.

How is this data being used? How is it consumed? How is it retired?

Once we understand that entire picture, then you can start understanding where in this flow you have problems. It's kind of like, you know [when] you're in your kitchen, you open a faucet, water comes out; can you drink that water? Or, should you not drink the water because the quality of water is bad? Before you can answer that question, you have to understand where that water is coming from. Where is the source? Which pipes is it going through? You have to understand different checkpoints to ensure the quality of water. Is it having chemicals that you should not be drinking? [etc.]

So, that's the first step, understanding what the problem is and then ensuring that you can understand where the problem exists in your ecosystem.

While we're talking about this, one other thing I'll [mention] is, the first step that companies should be doing is establishing a data governance program. Data governance is not a project – it is a program that runs for a long time and in that program, you establish roles and duties. You know who the product owners are, who the product stewards are, data stewards are, and what their roles or responsibilities are over different metrics of data. Then, you have to be able to monitor that as well. They're essentially seven different dimensions of data quality: you know, accuracy, validity, consistency, timeliness, and so on. It's their responsibility to ensure that data is following through, and it's of higher quality across all those dimensions.

[Nataly Arber] Should the programs start before you have identified some of those problems that you talked about?

You said, the key is to acknowledge that you have a problem, right? So, you go to the CFO, and you say we have this problem, this is how much money we're losing. Do you have to start identifying those [specific] problems before you develop the pieces of that program?

[Naveed Asem] That's a great question! So, what my recommendation typically is, someone who is head of data, or head of one of the departments, first [start] documenting how big the problem is. Once you understand that, that will help you define the program structure. Because in the data governance world, organizations can have different models that they follow. There is [one] model called "Federated." Then there's another model that's a little bit more centralized. Depending on what kind of problem you have, and how pervasive the problem is throughout the organization, it will help you figure out what kind of program you want to establish. So, my recommendation is, first understand the problem. Once you understand that, then you establish a program. And, once you have a program, then understand the entire end-to-end data lifecycle.

[Nataly Arber] Wonderful that makes a lot of sense and I think that it'll be helpful for a lot of companies that are looking to [develop a data governance program].

[Naveed Asem] Yes, and one [other] thing I'll say is, you know, a lot of companies jump into solutions. They will say, hey let's get machine learning in, or AI, to solve these problems. While those technologies can absolutely help you with those problems, it is not the first step. You know, this is basically putting a

cart before the horse. First you had to understand the problem, and then bring in technologies like ML and AI.

[Nataly Arber] That makes a lot of sense. I think right now, since it's so popular to introduce machine learning and AI, it's maybe one of the first things that somebody thinks of instead of going through the work, and integrating it later.

[Naveed Asem] Yep, it is the buzzword driven industry.

[Nataly Arber] Absolutely! So, I'm going to switch gears just a little bit here. I'd like to talk to you about a personal philosophy that you have. You wrote an article on LinkedIn entitled, "Always Eat Alone (when possible)," I was wondering if you could share a little bit about this philosophy and how you apply it to your work every day.

[Naveed Asem] Yes, absolutely! So, a couple of years ago, when I first started my career, I read a book called, "Never Eat Alone." So, in that book was a concept of, it's very important for you to always network and socialize. This concept of, you know, there's huge value when you're always networking, is important, especially when you're starting a new career. You're straight out of college, you want to progress in your career, and I've followed that philosophy for a very long time; Until, I started realizing that what it did to me was, I am always on. My brain is always working. I'm always thinking about my career, my job, everything else related to that, and the side effects of that mentality was that I wasn't paying attention to myself.

For those who know me, I'm a huge introvert. I am someone who is, I call myself, a thinker, dreamer. I like to innovate at home; I do a lot of side projects. And for someone like me who likes to spend a lot of time…when you're always networking, always doing things for other people, you're not paying attention to your own nurturing. And the side effect of that is, those things [that you] really like [and] enjoy doing, you will do less of that. So, the philosophy that I follow, and that's why I wrote that article, is it's very important to focus on emotional IQ. It's very important to focus on mindfulness; and mindfulness of what does your body need. Being gentle with yourself, being gentle with others, and the reason why it's very important is, when you're doing all that, you bring the best version of yourself to work.

When you're having lunch with someone, you bring the best version of yourself there. You're doing deep listening, you're understanding who they are, instead of just meeting with them because it's on your to-do list. [Instead of just sitting with the CIO of a company] you're actually meeting with them, you're getting to know them personally. So, my philosophy is care about yourself, about your mind and body, and then bring the best version of yourself out there.

[Nataly Arber] That's great, I think today, and in a time that we are "always on" it's something that people either forget or honestly might not have the time to do – taking time for themselves. So, it's really important that we keep that in front of us as something that we should make time for; and something that we value very highly.

[Naveed Asem] Absolutely, yes, thank you.

[Nataly Arber] As the risk and compliance industry continues to evolve, how do you see technology and data changing the future of risk and compliance?

[Naveed Asem] Yeah, so, obviously, since we're in the governance risk and compliance industry, I think about that quite a bit. And, within the technology department, we look at that ask as data and technology, what can we do to leverage the best of both? So, data exploitation of data is nothing new, IDC wrote a paper that talked about the explosion of data, that by 2025 there will be hundred seventy-five zettabytes of data. I don't even know what that is. It's essentially, you know, 21 zeros. So, that's a lot of data, right?

So, there's no denying that we're living in a world where there is a lot of data out there, and there's also no denying that technology is playing a huge role in how you leverage that data, and how you monetize

that. You will see a lot of companies that are going to the cloud first, they don't even go and have a data centers. Even the cloud providers, there's a lot of war going on between Amazon AWS, Microsoft Azure, and Google, which is helping all of us because they are improving their cloud offering. So, from the technology side, there are a lot of interesting and cutting-edge technologies out there that are available, that companies should be using.

Now, in the governance risk and compliance industry, if you think about what's important to us, it is basically better, faster, speed to market. If you're building a new product, if we are going to be addressing a new regulation that SEC published—SEC comes up with some timelines—it's very important for a company like us to make sure we build a product and bring it to the market as soon as possible, and that's where these cloud technologies help us. It's very easy and quick for us to deploy a new app in a Microsoft Azure, using their platform as a service offering, where they manage the databases for us. They manage where the code runs. Our job is to write a good quality of code and monitor that. So, the trend that we see quite a bit in the risk and compliance is a lot of companies are moving to the cloud. And a lot of companies like us, I would consider us, you know, leading the pack, because our enterprise data warehouse is cloud, it's all, everything is in the cloud. We had to figure out how to make it secure, we had to make sure that we have the scalability built in—we were able to scale up, scale out —our platforms. Because, going back to SEC regulation, there are certain peaks, so there are times where a lot of companies will file the forms, then there are times where no one is filing. So, using cloud, we were able to scale up and scale out during those peaks, where we could have, you know, 50, 60, servers running, and when the peak is done, we bring it down to you know just a few and that's where cloud helps us quite a bit. So, that is the technology trend that I see, companies like us, going to the cloud.

[Nataly Arber] Is there anything else that you see from a data perspective that's going to be coming down, maybe in five to ten years, a little bit further out?

[Naveed Asem] Yeah, I would say one thing that I think will be coming down, or should, is right now, SEC is asking companies to disclose; instead of that, SEC is having better transparency into companies' operations, perhaps using applications, APIs, to pull data directly on demand. So, the concept of having to file, may go away. Where SEC always has a pulse on how different companies are doing, and they are able to have that understanding in real time, because investors end of the day they look at SEC to ensure that they are making decisions based on the right data that's published. However, that data is always delayed, because companies, it takes them a while to file, if SEC has that connectivity into companies it can give those insights in real time, and very timely, and investors will make the investment decisions that are accurate, and in that situation, it's win-win for everyone.

[Nataly Arber] So do you think that the way that data would be interconnected is cloud-based as well? The SEC would have all the information somewhere that is accessible and companies can just upload their information without the formal filing needs that they have right now?

[Naveed Asem] Yes, there would be couple of options. One option is where SEC has some connectivity into companies' operations, which is very difficult, because you will have to custom build it for a lot of different companies. [The] Ideal scenario would be what you just described. SEC builds a solution where companies don't have to create a form and load it into SEC. What they do is basically upload their data in raw, and perhaps there is some kind of a feature where they can map it to what SEC is looking for.

There is a huge conversation going on around iXBRL, I mean DFIN has solutions around iXBRL, as well. So what iXBRL does, is you're basically tagging your data with certain elements that SEC can understand. So, the idea that I think will happen is, iXBRL will advance to a point, where companies are disclosing information using APIs in real-time, versus having to create iXBRL and sending it to the SEC. At least that's the direction we should be going.

[Nataly Arber] Oh interesting, well it also seems to bring the conversation full circle, right? The importance of data standardization couldn't be higher, if that is where the industry is headed.

[Naveed Asem] Exactly.

[Nataly Arber] Because otherwise they wouldn't be able to speak to each other.

[Naveed Asem] Yep, that's right.

[Nataly Arber] So, you mentioned, a little bit about machine learning as sort of a technology that companies can implement and use. I've spoken to you in the past, that you also teach a capstone course at Northwestern [University] on AI and machine learning. I was wondering if you could speak, a little bit, as an instructor, are there any discussions that you have in class, with your students that yield interesting takeaways that then you can apply at work or that make you think about AI in a different way?

[Naveed Asem] Yeah, so as you mentioned, I teach a part of a class at Northwestern University it is their executive program, it's called MSIT, and the people who are in that class they come from different backgrounds; there are people who are programmers, they're people who are data scientists, project managers, and so on. I love teaching that class because although I'm teaching, you know, machine learning and AI to them, I'm also, based on the questions they ask, I'm learning from them. And, what I'm learning from them is their perception of AI.

So, machine learning and AI is nothing new it's been around for many years; however, if you ask someone who is not very familiar with machine learning and AI, they think of that as robots and self-driving cars — they want to put a face to it. Machine learning and AI is more than that. They're aspects of it, such as natural language generation, natural language processing, things that are being used in Alexa, or being used in to complete your sentences in Gmail; those are the examples of machine learning AI that a lot of people still don't understand. So, what I take away from teaching that class is, we need to teach more what AI can do, and only then organizations out there, and the leaders, can understand the true potential of AI. Because the conversation of what will do when AI is here is gone. AI is already here; it's all around us.

So, the question now is what can we do with AI to make our life better — not [just] for ourselves, our customers, our company, for everyone around us. And I think that's my biggest takeaway.

[Nataly Arber] I know in the in the media right now, they talk a lot about how machine learning and AI — much to your point about people putting a face to it, and thinking it's robots — and the trope is that machine learning and artificial intelligence are taking over people's jobs, which isn't the case, it is, to your point, making our lives easier and better in different ways.

How do we combat that? How do we make people understand that it's an aid to what we do, and that our jobs are safe?

[Naveed Asem] Yeah, so that's a good point, and someone actually asked that question in one of the classes I was teaching. Their question was, what would we do when machines take over and I don't have a job? So, my point to that was, it is not a war of technology versus humankind. Essentially, the technologies out there aid and support us. So, when someone asked me that question I ask them, can you think of things you do today that are very manual in nature, then you wish you could outsource through someone else, someone else doing that for you. If you can think of one thing, that would be a use case for AI!

And, I asked that question to myself. I can think of many things that I do per day, that I can outsource to machine learning or AI, and that can help me with that. So, I don't think machine learning and AI is going to take over people's jobs per se, but I do think what it would do is, it will make our lives more efficient. It will enable and empower us to do more than what we do today. If I'm spending two hours doing those manual, mundane tasks, if I can get AI to do that for me, guess what? Those are two hours that I can actually do my job better, right? And, another day, if that's the case, maybe I get to spend more time with

my family, my wife and my daughter! So, I think machine learning and AI is here not to take over our jobs, but to make our jobs more meaningful to us, and make our personal lives more meaningful to us.

[Nataly Arber] That's wonderful! So, tell me a little bit about some projects that you're working on that you're excited about right now?

[Naveed Asem] Yes, so within DFIN, we have a data science team that I built and my head of data science, her name is Hyunzoo, she is very, extremely talented, she is leading a couple of different projects and they are all around natural language processing and natural language generation and deep learning. So, the way we're using those technologies is a doing a lot of document analysis. We have a new product that we built, it's called FundAnalyzer. What it does, is you bring shareholder reports, prospectuses, anything, you give us hundreds of those documents, we will use natural language processing (NLP) to analyze all of those documents in both, and we'll give you a report of how those documents align.

A lot of our customers, they manage funds; they want to be able to see how those funds documents are different, or similar, and also, the concept of roll forward. If you file a report, or if you have a report for a fund, and the next period you wanna generate something similar, instead of starting from scratch, you can basically use NLP to generate that report for you. So, those are some of the things that we are working on.

Another project that I am personally very excited about is a tagging project. I unfortunately can't disclose a whole lot, but it is something that we believe will change our industry quite a bit. Where we use deep learning techniques to do tagging of documents.

[Nataly Arber] Very exciting! It's nice to hear that we're incorporating some of those newer technologies, that everybody is very excited about.

I want to thank you so much for joining me today. I have just one more question that I want to ask you and it's a favorite of mine. I want to ask you about your phone and your behavior. Is there an app on your phone, that you personally enjoy using, that might help you do your job better as well?

[Naveed Asem] Yes! So I have a couple of apps that I love, but one app that I would say I use almost every night is the [headspace](#)! Headspace is the app that was recommended to me by my wife. She uses headspace quite a bit. She's a physician throughout the day, she's doing surgeries, has a lot of patients, so she would take some time to listen to headspace and it kind of calms you down. It's almost similar to doing meditation. I love that app, and also, it's something that I use, now almost nightly basis, with my daughter. We just sit down, lay down, we listen to Andy [Puddicombe], talk about our day, thinking about things that are making is anxious, anxiety, how to combat that. And one of the things that I started doing recently is they have this whole area about mindful eating! So, I have been on a journey to lose weight; I've already lost about 40 pounds in last two to three years. I've gotten to a point where now I'm focusing more on mindful eating, and headspace helps me with that quite a bit.

[Nataly Arber] So interesting! You hear a lot about being mindful and mindfulness in general, and just breathing and taking account of what your body needs. So, using that with your eating habits seems very interesting as well.

[Naveed Asem] It is!

[Nataly Arber] Thank you so much for sharing all of your thoughts and everything that you're working on.

[Naveed Asem] Well, thank you for having me here! It's always a pleasure talking about data and analytics, and I'm hoping and looking forward to future sessions, perhaps you can talk a little bit more about AI.

[Nataly Arber] Sounds great, thanks!