

# How I Stopped Worrying and Learned to Love the Cloud

*Featuring:*

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Adam Bass (00:03):

This is MSCI Perspectives, your source for insights for global investors and access to research and expertise from across the investment industry. I'm your host Adam Bass, and today is June 10th, 2021. Today, we talked on this program before about the impact that advances in technology have had on investors across the spectrum. How today, we can do things faster, more efficiently, and at much lower cost than ever before.

Adam Bass (00:34):

But a big part of what makes that possible is moving process and data into what's known as the cloud, and also moving from a mindset of I, me, mine, to a little closer to come together. Sorry, big Beatles fan. To help us understand this new paradigm, we have two guests today whose career paths have both centered around the power and the possibilities of technology, and those career paths have now intersected.

Roman Kouzmenko (01:06):

My name is Roman Kouzmenko, I've been with MSCI for over 15 years, actually 15 years and eight days to be exact. I started on the 1st of June in 2006 as an intern. And right now I'm responsible for the MSCI Data Science Research Team, which is part of the broader research and product development organization and cuts across all MSCI product lines.

Adam Bass (01:33):

And also joining us is.

Dania Kodeih (01:35):

My name is Dania Kodeih, and I'm a recent joiner at MSCI. I joined from Microsoft, where I spent the last five and a half years. But I've had overall 26-year career in the technology industry mainly focused on internal IT, business-focused IT, and industry-focused IT.

Adam Bass (01:54):

As a recent joiner as she put it, I asked Dania to share her impressions of the investment industry, in terms of how tightly it has embraced technology as a whole. Here's her response.

Dania Kodeih (02:07):

Yes, what I've seen in the investment industry is you have the traditional very sort of conservative industry. Not very keen on taking on a new technology changes, and a bit reluctant to change, because there's a lot of risk that comes with change. But at the same time, I see this as an industry that's being disrupted.

Dania Kodeih (02:28):

We see the emergence of the newer types of investment tools out there with the millennial generations that have attached to their phones, doing everything on their phone. For example, Robinhood, if you look at kind of what Robinhood has disrupted the investment world entirely, and it made a difference on how you actually place trade and invest, but also made it directly tied to the handheld devices that we take everywhere with us.

Dania Kodeih (02:56):

And I see, in parallel to that, the rise in computing capacity, AI being embedded in a lot of the investment tools and methodologies that we're seeing. In the sense, yes, the investment industry has been forced to adapt and absorb all of the new technology innovation, because of the disruption that's coming from some new emergent players in the space.

Adam Bass (03:22):

Fair enough. Roman now, with his 15 years and eight days of investment industry experience, he didn't disagree, but he did go on to cite some of the internal forces that are driving this disruption.

Roman Kouzmenko (03:37):

I think that there has been a tremendous changes in the past 15 years or so, which I've been in this industry. It's been quite fun to keep up with them and try to stay ahead. To me what really stands out in this period is the democratization of the data science stack.

Adam Bass (03:58):

In case I'm not the only one who wasn't clear what a stack is.

Roman Kouzmenko (04:03):

By stack, we just mean the whole ecosystem of all the tools that make up a platform. Typically, in a data science kind of stack of these days, you'd find hundreds and hundreds of packages and technologies produced by different people that you can combine to create the

whole platform. You could have in their packages to slice and dice data, apply machine learning as examples, or even simulate a strategy going back 10 years, something like that.

Roman Kouzmenko (04:43):

Technically, we've seen a huge shift, I think from expensive proprietary software we used for data analysis to an open source stack. The stack now is available to anyone to build on, and it is free, again, in both meanings of the word. Both free in terms of licensing and also free to extend and build upon.

Roman Kouzmenko (05:08):

Secondly, given this kind of this world of more and more data, the second aspect of this evolution is also human, whereby the data analysis and programming skills are kind of becoming more and more of a basic skill, and there is an emergence of and it's word like, of what it's called nowadays, Citizen Developers. This refers to people that are familiar and know how to use data analysis techniques and tools, but whose main job or even education background is not software engineers.

Adam Bass (05:44):

That reminded me of something Nicholas Grous from ARK Invest mentioned when he joined us earlier this year. He spoke about how there's no need to start from scratch anymore when it comes to programming. There are bits of code that you can literally copy and paste. Now, Nick was talking about the trajectory of a bullet in a game like Fortnite. I assumed Roman was not, but asked him whether the concept was the same.

Roman Kouzmenko (06:11):

Absolutely. I think it's a trend in general in technology where basically the things that once were considered kind of difficult, and were specialized overtime become a commodity, and like a building block to build something else and something new. Basically, you have these kind of building blocks, you can think of them as kind of Lego bricks, and then all you do is simply you combine them in a way that is useful to showcase what you want to achieve. It really takes a very little code to create such an interactive experience.

Roman Kouzmenko (06:50):

And perhaps an example for us is that in the data science team we're developing what we call MSCI apps, which allows us to very rapidly provide an interactive experience that we can expose to clients, or publish on our website. Thanks to these kind of building blocks. There's a number of for instance, of widgets of around the user experience, that you can simply reuse to build some interactive experience in a matter of hours and not days or weeks as was used to be the case in the past.

Dania Kodeih (07:30):

The rise of cloud also gives you the ability to do things that are low code. We used that terminology a lot when I was at Microsoft. They're sort of free program components that you can reuse and customize, but some of them are really apps. Microsoft has this power platform, and if you've looked at it, you can actually design an app for your device very, very quickly, and without having my highly sophisticated programming skills to come with that.

Dania Kodeih (07:59):

If you're a business analyst or a researcher, you can build a visualization dashboard in Power BI, or you can you use Power Apps to build your own web app on your iPhone or other sort of handheld device and take it with you. And there is that ability to do that now with more of these technologies that are emerging as well. And Microsoft, not the only one that has that, other companies are doing the same.

Adam Bass (08:23):

So far, we have an industry being disrupted by external and internal forces, and huge potential from computing power that's not only advancing at a nearly inconceivable rate, but is also easier for more novice and even non-programmers to use. And most of this is possible because of the cloud, it's changed how companies across sectors operate, even the sector that created it.

Dania Kodeih (08:50):

The entire engineering process to build software had to adapt to the cloud world as well. You hear a lot about waterfall methodology being sort of the traditional software delivery process that's been left behind the years ago, even before cloud emerged as the destination for a lot of the compute that's being created.

Adam Bass (09:11):

Waterfall methodology is essentially a software development process that flows steadily and sequentially through a series of steps, and importantly only in one direction. That's opposed to a more iterative or agile process.

Dania Kodeih (09:26):

But in addition to just becoming more agile and more nimble, and the execution side of building software, a change in how software is built and deployed has also been introduced by the clouds technologies. There's this rise of DevOps, now we talk a lot about DevOps as a product, but really DevOps is a fast on-ramp of new software to the destination.

Dania Kodeih (09:50):

You take a new piece of software, you want to take it from conception, to deployment, to the user's hands. And that is the process by which we do that more effectively and quickly. Also

how you design systems has changed, you no longer have to do all of this complex provisioning of infrastructure at a time.

Dania Kodeih (10:11):

The way you budget for it is different, because now, you just have to provision a piece of infrastructure in the cloud, and then it's a monthly price you pay versus an upfront capital expenditure that you have to allow and budget for. Overall from a system design and engineering, the process has shifted and changed. But also on the technology itself, scale in the cloud is not really a problem, it becomes a much different conversation than before.

Roman Kouzmenko (10:42):

The biggest advantage I would say is, automated scalability. So when you build an app for the cloud, you can really start small, and as your app gets used more and more, there are ways to make the underlying infrastructure scale automatically without having to purchase all this hardware from the get-go.

Roman Kouzmenko (11:06):

Another advantage of a similar technique is that if your app, for instance, is used a lot more during the day than during the night, or in a global context, probably it's less relevant, the system allows you to scale down and up resources as the client demand evolves. That's something that is much more difficult to do on-prem, where you would need to basically to acquire your maximum capacity upfront, and always target this maximum capacity.

Adam Bass (11:38):

That's incredible, it's not only scalable in the sense, like you said, that you only pay for what you need as time goes on, but if I'm hearing you correctly, it's dynamic even over a 24 hour period. Is that right?

Roman Kouzmenko (11:54):

Absolutely. And for example, during weekends, you can typically spin it down and all this can be based on a fully automated set of metrics. You define your threshold for scaling up or down, and the system will adjust the whole thing automatically, according to the load.

Dania Kodeih (12:15):

It's not even just user-based, it's almost process-based, we call it elasticity actually. You're elastically scaling out to the needs of your user demand if you're dealing with users accessing an application, but the elasticity also has to do with compute. Give you an example, when I worked in energy, we had these very, very large models, seismic imaging models that we would run on these specialized compute hardware, and those specialized compute hardware is very expensive.

Dania Kodeih (12:48):

But these models don't happen often, you don't run these models frequently. You may do a project, you spin up the clusters you need for a few days, maybe a few weeks, and then you shut them down. You get that elasticity, and sometimes even within the day, you may have one or two algorithms that you want to around for point in time to get an answer.

Dania Kodeih (13:11):

And in that case, you want to scale your hardware infrastructure to support the algorithm. But then once you got your answer, your calculation is done. You shut it down and then you don't have to pay for it. In the traditional sense, and kind of going back to my experience in the energy industry, when I worked in VP in 2015, we had a special Bill's hardware called the High Performance Computing Center that we built and designed for that use case.

Dania Kodeih (13:36):

And it was sized to a certain point, it was fixed in as dementias. There was expansion capability, but usually you would expand in one direction. And when you bring in new models and new studies that you wanted to do, they sat in a queue. And so that limited the business and how much they could do at the same time, because you had that sort of fixed capacity that you can handle.

Dania Kodeih (14:01):

And then the hardware was leased in three year cycles, you would get the latest hardware, and you were always kind of refreshing it, but it was also limited in time. Today, if you're using Azure, for example, or AWS, you have the ability to size your infrastructure according to that particular problem.

Dania Kodeih (14:20):

If there's a new research opportunity and you find you wanted to go investigate, you would run the model you need for that period of time, get the capacity, run the model, and then release it back. And then if you don't need it anymore, you're not paying for that infrastructure long-term. And more importantly, your models can become more and more sophisticated, because now you have access to new hardware on a very, very regular refresh cycle as well.

Adam Bass (14:44):

It was starting to sound like the possibilities are endless, which is exciting, of course, but also a bit too conceptual. It feels like a good time to talk about a concrete investor related example.

Roman Kouzmenko (15:00):

As an example, perhaps we recently developed, it's still kind of in testing internally, a small app to get clients feedback on how to simulate a portfolio trajectory towards net zero, that's

around climate. And so in the past where we would kind of build PowerPoint decks, then go talk to clients with them to get their feedback. But here we can just share basically a prototype of an application very rapidly, which is interactive, and with which they can play with and adjust different parameters, and see what happens to get feedback a lot more quickly.

Adam Bass (15:43):

Let's define quickly here, how long would the process be start to finish in the old way, and how quickly were you able to build and release this tool today?

Roman Kouzmenko (15:54):

Sure. In the old way, it will be fairly cumbersome, because typically you would need to request a new hardware, and then configure it, requests databases, and what have you, before you can even start kind of your app development. Here in the new way, we use a cloud provider to deploy our app soon. We have a very simple way for researchers that don't need to know anything about the underlying infrastructure, they just focus on the logic of the app.

Roman Kouzmenko (16:29):

And then there's a way for them to push it, and then it becomes instantly available on the cloud. And then we have a controlled process of course, to push it and make it available externally. But that's more about governance rather than the technology. Overall, you can build something like a simple app in a matter of hours on the data science platform.

Adam Bass (16:54):

Building an app in a matter of hours, amazing, and also necessary in a world where people are constantly on their phones, and able to access information in seconds. I was left wondering though about one big reason, some firms may have trouble moving away from on-premise operations and proprietary software, why they remain as Dania put it during our interview, server huggers, one word security. Are there security concerns by working in the cloud?

Roman Kouzmenko (17:28):

Well, of course they are, but they're not that different from the ones you have on-prem. And secondly, typically the cloud providers would employ much larger security teams that look at how to establish the best security practices than any kind of single company such as ours would do on their own.

Roman Kouzmenko (17:55):

And of course it doesn't remove the need to have governance and controls on how someone exposes different services on the cloud, so at least are secure. But overall, in terms of securing kind of the infrastructure, updating the systems, patching for the latest vulnerabilities, a cloud provider is better equipped, thanks to scale benefits than any given company.

Dania Kodeih (18:25):

Security is not a concern only for the cloud, and it's not really a concern that happens when you start moving to the cloud. Security is a concern you carry forward, whether you having applications in your on-premise data center or not. Frankly there's no difference, these cloud companies have spent millions and millions of dollars on ensuring that their cloud environments, and platforms, and data center is highly secure.

Dania Kodeih (18:50):

But it's also you as the provider, it's still your responsibility to ensure that your applications and [inaudible 00:18:55] developing are secure. We used to talk about this as a defense in depth, it's a common terminology used in security across all industries, but really it's the idea that you want to secure your perimeter, you want to secure your system, you want to secure your networks all the way down to that actual data sitting in the storage array on desk that you're trying to ensure the consistency and security of that data.

Dania Kodeih (19:25):

What you want to do is assume that you are going to be hacked, assume that you are going to be breached, and in addition to the security layers, build in the ability for you to quickly detect when a breach has happened and be able to shut it down fast. That's the other side of it, as you build observability, you build alerts, and validation, and all kinds of layers of detection into your products and suits.

Dania Kodeih (19:54):

And when you're using the cloud, that is part of the framework that you have access to in a cloud environment. Especially if you're using platform as a service tools, pass tools, because they are designed to help you detect breaches and inappropriate access, as well as part of the way they're building the cloud platforms. Overall, in a sense, it's actually easier to be safe and secure in a cloud environment than it is on on-premise environment, where you could have blind spots.

Adam Bass (20:26):

What became perfectly clear as I spoke to Dania and Roman, was that we are past the idea that there's a choice here. It shouldn't come as any surprise either. From our discussions around smart cities, to the tech revolution in China, and all the way into the metaverse, it's clear, we are soaring into the cloud, an increasingly rapid pace. The choice at this point is about how specifically to put it to use. And as each interviewed you to a close, I had to ask what's next.

Dania Kodeih (20:59):

I don't know if that is necessarily next, I don't know, because it's growing in parallel as a sort of separate space, but it's converging, but I don't know if you're paying attention to what's

going on in the IoT space. That's also emerged very quickly. We went from the control system, complex, isolated, and requires highly specialized skills to manage to this internet of things.

Dania Kodeih (21:24):

Now we have compute and sometimes cloud scale compute at the edge, that is bringing data and computation and models and algorithms directly to where the data's being collected. In a sense, that's also creating this entirely new space with smart cities, and I've seen that in the manufacturing space like the smart factories, also in consumer devices like AR, VR, and even self-driving cars.

Dania Kodeih (21:55):

The AI capability requires a lot of compute, what we're seeing is that the compute is also shrinking. It can be at the site of data collection, and be able to also connect with the cloud so you can do the training and sort of the bigger things that require the massive clusters. But those two together are almost like two poles of one continuum that will be transforming our real life very quickly and in a rapid pace.

Roman Kouzmenko (22:26):

And to be honest, it's really difficult to predict what the needs will be in the future. I'd say that most likely it's going to be something that will come as a surprise to us. And so the important thing is being ready basically to react and adapt to changes quickly.

Adam Bass (22:45):

That's all for this week, our thanks to Roman and Dania, and to all of you for listening. If you like what you hear on Perspectives, please, don't keep it a secret. Subscribe, or leave a rating, leave a comment, we would love to hear from you. Until next time, I'm your host Adam Bass, and this is MSCI Perspectives. Stay safe.

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