Topic 2a - The New 'Internet of Data' – Overview

We absolutely are seeing developments coming in adjacent sectors that are beginning to transform space. On top of that, we're also seeing the space industry develop. In recent years, with the development of services like Copernicus, that permanently supply an infrastructure of data coming from space, we're starting to see these adjacent developments, like AI, like the cloud, like big data, like fast investment, like risk-taking investment, like new entrepreneurship come along and apply principles that have been developed, say, in software engineering or product development come to space.

In the last couple of years, we've seen a lot of interesting technology come out that made new applications and new scenarios possible. This is including new data sets, cheaper data sets, but also, not just the satellite component to this but also the terrestrial component. So this is the underlying technologies. This is cloud computing. This is new computing architectures. This is about graphical processing. This is about high-performance computing.

But then it's also the software that sits behind this. It's also then the artificial intelligence. It's also then the security and the provenance of this data as well. All of this is becoming more and more strong, which is allowing us to give more and more credible applications to the end users.

The industry is in a state of symbiosis in the sense that this deluge of data is coming in at exactly the same time as we have this increasing demand of data. And this is going hand in hand with where we are as a civilization globally.

People are calling out for more data. People are calling out for data in real-time, on the move, always. And actually, that's being then mirrored within the satellite industry as we start to see this new space come into view.

We've started to see, in the last sort of half a decade or so, the proliferation of cloud computing. And this has been really exciting for multiple different reasons but one the biggest ones is that we're now starting to get archives of satellite data that are petabytes if not exabytes in size.

So it's no longer possible to process that imagery on a single laptop. So therefore, people are going towards the data now instead of the data going towards the laptop. And this is something that we've been talking about in the industry for the last two or three years.

Actually, when we start to think about cloud computing, where you've got Amazon Web Services, you've got SAP, you've got Microsoft Azure, a whole bunch and whole different range of these across the globe. Actually, they're starting to get to a price point now where it becomes really exciting and really possible to be able to do this in a financially viable way now.

You can start to turn your own computer into a high-performance computer. Instead of waiting weeks or months for a single process to take place, you can now do this over a matter of minutes and hours, and this completely changes the dynamics of the service industry.

Basically, now, the cloud is a supercomputer available from their laptop. But what I think is important for EO is that you have the data just being there. You don't worry about that. You don't care about there. And you can get them very fast.

And also, that you have resources which you can scale when you need and you can scale down when you don't need them anymore so that you can create a sustainable solution. Because of the democratisation of the data, everyone will have access to the unbiased view to our planet, and I think this will change dramatically how we look at things.

Just a few years ago, if you wanted to work with a terabyte of data, you needed to have a terabyte of hard disc storage, and you also had to figure out how you're going to copy it all. A long time ago, if you wanted to do a certain kind of research, you'd have to physically go to the library where they had the archives that you would want to look at to do that, and the cloud has changed all of that. We can make petabytes of data available for anybody to work with without having to acquire it.

We don't think we're going to provide some sort of platform that's going to give people all the answers. But what we do know is that if we give people access to data and give them access to very scalable computing resources, it's a lot cheaper to ask questions of that data. And that's how people are going to find the answers. And what that does is it allows people to ask more questions.

If you look into the industry, what's happening today is that every time you want to come up with a new service, you start to reinvent the wheel. It's like a bit pre-industrial revolution like in the industry. So if you come, you have a good idea, you want to come up with a service, you have to think about everything.

Where do you get your raw material? You have to bring this raw material into a advanced processing stage. You have to build up your facility. You have to produce your product. You have to sell it. You have to build up an administration. And all this is effort. All this is an upfront investment.

And I think that's the key-- what we change is that we offer all that as a service. You don't have to buy it. You don't have to establish it. You can build upon the knowledge of others. You don't have to know everything.

I think the emergence of those big players like AWS, also that companies like Digital Globe put all their data on the cloud actually is very important for that because you need this performance. You need this power to really do large-scale processing on demand, in near real time, which would be essential for a lot of those services which are now coming up and which we also offer on our platform.

What we're trying to do is help people understand how to work with data in the cloud. And we think it's pretty clear at this point that there are real benefits, real obvious benefits to making data available on the cloud. One of which is just that anybody can work with any volume of data without having to acquire it. And that's really powerful, and it might not be obvious to a lot of people.

As far as other emerging technologies go, one that's very obvious to me is the internet of things or just more connected devices and more sensors, right? So all kinds of sensors are constantly getting cheaper. They're constantly getting smaller. They're constantly getting more energy efficient and that's really exciting.

I mean, in this community, we often think about Earth observation data, and we think, well, it's remotely sensed satellite imagery, or there's some sort of instrument on a satellite. And that's what we're talking about with Earth observations. There is a ton of Earth observations happening on the ground, and producing that data is getting faster and better and cheaper. And that's going to really drive some exciting and crazy insights.

Costs are coming down with all the nanosatellites, so access to space is much, much cheaper. And now the barriers are even brought further down with blockchain because blockchain is adding trust into the data and to access to the assets. And this will lead into an entirely new space-based supply chain of data and services, enabling, again, new business models and new solutions for the greater good of the planet.

Tons of people's smartphones have GPUs on them, right? So the ability to do pretty sophisticated processing with really small devices is really exciting. And actually, yeah, one of my favorite examples of an application of the landsat data that we posted is a thing called Observed Earth, which was an app built by a single developer in Melbourne, Australia that took advantage of the iPhones' GPUS, right, and their gaming engine. That stuff is just sort of mind-blowing, and we just take it for granted now that that's possible.

There's a bit of a lag that's happening right now. The data is all there. The computing power is all there. And there's a lot of experimentation going on right now. We're continually surprised by what people are coming up with.