



We Are Vodafone - Episode 11

Transcript

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HOST

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GUESTS

Erik Brenneis and Phi Skipper

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Tim Samuels 00:06

This is We Are Vodafone, a podcast about technology and its power to change our world. From AI and the Metaverse to flying cars and fruit picking robots, in this series will lift the lid on the exciting innovations, changing how we live and work both now, and in the future.

In this episode of We Are Vodafone, we're exploring the wild, wondrous future of connected devices, otherwise known as the Internet of Things, or IoT for short. The IoT is an ecosystem of millions of connected devices, all with the ability to communicate with us, or each other. Think connected cars that warn drivers of hazards on the road, or air quality sensors that detects high levels of pollution, or even forest fires, the possibilities are endless. I'm Tim Samuels bringing you this series about the power of technology to drive change around the world. I'm joined by Erik Brenneis, IoT Director at Vodafone Business, and Phil Skipper, Head of IoT Strategy at Vodafone Business, who can tell us more about this exciting tech evolution.

Erik Brenneis 01:18

The Internet of Things is basically any device, which is not a human, or a normal computer or a phone that talk to each other. Whenever something communicates, whether it's an elevator sending message, "hey I'm stuck", or whether it's a car, sending an emergency call and message, "hey, my engine has broken", or whether it's a smart meter, sending the data usage, these are all Internet of Things, applications. So, anything that sends some information, which is not a human is actually an IoT device. And now already today, the Internet of Things is all around us. You know, if you go somewhere to a restaurant, you pay with your credit card, through a credit card reader which the waiter brings to the table, there is an Internet of Things connection in there, most likely in your home, you have several IoT connections, in your electricity meter in your basement, probably, if you have a car, which is younger than seven years, most likely, you'll have an IoT connection in it. So, it's all around us. And still, there are more and more applications coming every day. And still, we're only in the beginning.



Tim Samuels 02:33

Previously, going back 15 years, you know you're in a lift, it gets stuck, you've got to pick up the phone that's in the lift and hope it works devices are not talking to each other.

Erik Brenneis 02:42

Yeah, or you have to bang at the wall and hope that somebody hears you. For your meters, many people will still remember the times, you know, you had to be home for a morning in order to open your door for the meter reader, who then takes your consumption. If your car broke down, and you know, you had to go outside and wave somebody who would then possibly help you. So basically, um, the Internet of Things, puts communication into things, which before, that weren't communicating, and therefore all these new services also came up.

Tim Samuels 03:15

Phil, how's your morning been affected by IoT devices so far.

Phil Skipper 03:19

If I look around my house, I'd give you some examples. I have a connected smart meter, so I know exactly how much power I've taken. I also have a electric vehicle charging post at my house. I was out this morning, the traffic lights are connected, you know, my phone is connected for navigation. So everything that you see, and you do, somehow has IoT driving it. And it's one of those wonderful things that it's noninvasive, you just get the benefit of it from having all of these devices connected all around you.

Tim Samuels 03:52

It's one thing to have a meter that's being read for cars to be charged. But I think what's interesting is the much, much bigger impact that the Internet of Things can have, particularly when we look on a planetary level. Phil, if you can take me to Ibiza, tell me how IoT has been used over there in terms of sustainability.

Phil Skipper 04:13

They have a number of problems with too many people on the beaches, they have a problem with water quality, and so on. So what IoT does is it provides that authority, the ability to actually monitor what's going on. Very simply by having boats moored in the harbour, they're actually detecting water quality, every minute. They're also monitoring how many people are going off and on to the beach. And particularly important right now, is the ability to use IoT to detect forest fires. And again, it's something where you can deploy these devices very efficiently. They work 24/7, and you can actually get the information that you need to respond earlier or more effectively. You communicate with multiple different sensors, measuring multiple different things, and all bring them back into the same place. So, you get this deep insight on what is going on around you,

Tim Samuels 05:11

Erik, the impact to people's quality of life in Ibiza, what's that going to be?

Erik Brenneis 05:17

Pollution will go down, it won't be as overcrowded, you can take all these measures from the data insights you get, in order to ensure that the ecosystem remains stable.

Tim Samuels 05:30



And, looking kind of closer to home, for those of us in the UK, water. There have been some reports showing that recently, we've been leaking up to a quarter, a quarter of our water supply, how can IoT be deployed to help address this issue?

Phil Skipper 05:47

The problem you've got with a water network is all underground. It's old. And it's massive. It's a huge distributed network. So, you need to be able to detect where the problems are. And you can get sensors, which travel in the pipes are connected to the pipes, and they can actually listen or use ultrasonic to detect where that leakage is, and they can pinpoint it very accurately. You can then fix the pipe and fix the leak. The nice thing about IoT is because it communicates over such a wide area, it's ideally suited for these big national infrastructures like electricity, water, and gas. But we also shouldn't forget that there is water leakage in homes. And the same technology can be deployed in the domestic environment, where you can actually detect when your own pipes are leaking, and then stop the damage to your house. Water is a great example of where IoT and sustainability combine. Not only are you making the water network more efficient, you're also safeguarding a really important raw material, that is actually quite expensive to produce. So IoT solves both of those problems,

Tim Samuels 07:01

Water as well as crucial to agriculture, again, a huge force when it comes to climate change. How is IoT being deployed in agriculture?

Phil Skipper 07:12

So, you can use it to, for instance, sense pests, there are devices where it can actually using artificial intelligence, recognize what pests are being caught. More important than that you know where it's landed, so rather than having to spray the whole field, you can actually just spray the bit that's infected. Likewise, with water, you spray the bits that need watering, you don't put water on to everything. And the same with fertilizer, you can apply these materials in a much more efficient way. That's driving efficiency for the farmer, but also making sure that the environmental impact is absolutely minimized. We do a lot of work in places like Africa, and they're seeing, by using this technology, a 15 to 20% increase in yield. Being able to produce more for less is a great thing. And that's again, something that IoT enables with precision agriculture.

Tim Samuels 08:07

Phil and Erik, if you were farmers with adjoining fields, you're a traditional farmer Phil, Erik's IoT farming, as you look over the fence each other what advantages would Erik have over Phil?

Phil Skipper 08:19

I'm going to spend most of my time in the field digging holes and looking at soil and looking at plants. Erik is going to be sitting at home, watching his TV with a beer, letting a drone monitor his crops for him.

Erik Brenneis 08:31

And I'm still going to have the higher output. I also won't need to be up and awake at night when one of my cows is about to give birth because my IoT system will wake me up and send me a message when that's about to happen, whereas Phil needs to always be on standby. I mean it's a huge change in quality of life. And also output at the same.

Tim Samuels 08:54



Figure forgive my ignorance, how would a device tell you that you have a an animal birth happening?

Erik Brenneis 09:01

So, there is a device, which one of our partners designed with us, which is clipped on the tail of a cow. And it measures vital parameters such as pulse, body temperature, in so on and so forth. And when a cow is about to give birth, that's easily identifiable through all these parameters, and then the device sends a message to the farmer, "hey, it's time now you should come down and help".

Tim Samuels 09:26

If you were a farmer in the developing world, those gains could be far more life changing than farmer Erik having a bit more time in bed and not having to go and manually check on the pregnancy levels of your cows.

Erik Brenneis 09:40

It is life changing. And society changing actually, for many societies, not only on an individual level.

Phil Skipper 09:47

A lot of the precision agriculture solutions we do are actually in Africa and therefore small farmers, we've got about 8,000 farms already connected using the system. And what's actually happened is because they were able to produce more crops, they can move from simply subsistence into being able to drive an economy around there small holder farms. So, they're able to produce more, they're able to, for the first time sell it and start getting revenue back into the farm. And we've seen so many changes, especially in the African agricultural market. For instance, being able to use IoT to lease out tractors, which is in some cases, you know, the first time smallholders have had access to mechanized farming. And also, we're seeing plans where you can actually buy seed to grow with all the experience and the monitoring to make sure that that season is successful. So, it's no longer just producing what you need. It's actually producing what you need, plus some more, which is starting to drive these local economies. We've also introduced something called M-PESA, which actually enables these farmers to interact financially through their smartphones. So, it brings together this sort of micro economy around small scale farming, that's very efficient, and generates income for farmers that they probably never seen before.

Tim Samuels 11:17

Small gains at scale have a kind of global impact. And I guess that could also be applied to biodiversity. You know, we're not just making the world hotter and drier, species are dying off as much as 1,000 times more frequently than before us humans arrived, 60 million years ago. Biodiversity, it's an urgent issue. Erik, if we were to head up to the southwest of Scotland and the river Nith, what would we see in terms of attempts to preserve wildlife there?

Erik Brenneis 11:47

So, at the River Nith, we're having one of our biodiversity projects in which we're working together with Extreme E, which is a race in remote areas of the world to promote environmental activities. And at the River Nith there is historically, a lot of Atlantic salmon. This is one of their key rivers. And the salmon there is having difficulties to find enough food, because of rising water temperatures, there is also less rain at the moment than there used to be. And we installed sensors there to understand exactly the water temperature, the water quality, the rainfall, and then we recommended actions such as planting 200 hectares of woodland along the riverside, which in turn



helps stabilize the ground, cool down the water again, through more shade, and actually helps the salmon, and this is just one example of such biodiversity projects that we're doing.

Tim Samuels 12:46

Phil, are you optimistic this will this will make a difference to salmon levels?

Phil Skipper 12:49

Yes, I am. And I think it's one of these things where it's not going to be immediate. So, if you're planting 200 hectares of trees, it's going to take some time for them to provide the shade. And I think that's true with all of these biodiversity projects. They're going to need time to come to fruition. But, it's your ability to monitor detect the trend and see that improvement. It's true with other projects that we've done in terms of, you know, tracking seals, for instance, to actually understand where they're going to get their food, birds, where they're migrating to. It gives you that insight to make sure that you're making the right decisions today, which are going to have a positive impact for the future.

Erik Brenneis 13:28

The seal tracking actually is one of the very first biodiversity projects that we had. That was already more than 10 years ago, when we tracked the very first seals with the University of St. Andrews in Scotland. And that gave a lot of insight about how they lead their lives so that we can protect their environment better. For example, what came out of this research study, and there we have results because it was more than 10 years ago, was that they swim incredibly far, dozens of kilometers away from their main location. And based on these insights, the researchers actually were able to better protect the seals subsequently,

Tim Samuels 14:09

Phil, for this to really have an impact, do you envisage a world where there are sensors in multiple rivers and multiple species being monitored, almost in some sort of way in which we're monitoring nature in real time?

Phil Skipper 14:25

Yes. And you know, there are already lots of sensors in the watercourses to detect things like floods. There is also systems in the wastewater to detect leakage of sewage and wastewater. The question is, how do you bring them all together so that you can get a concerted approach to solving the problem? So, you're measuring the same thing from many different angles and that's giving you much deeper insight in what's happening and therefore what you then need to do about it.

Erik Brenneis 14:57

But actually, on this one, Tim and Phil, I believe that absolutely yes, sensors in the future at rivers and in other places will be everywhere. And it will be just as natural as having a traffic light at any big intersection. So these things are going to be normal. And today's the beginning.

Tim Samuels 15:18

People have been monitoring salmon, seals, and going up the food chain, whales. Erik, tell me about efforts in South Africa to help these extraordinary creatures to survive and thrive.

Erik Brenneis 15:31

Super fascinating project with the World Wildlife Fund. It's a problem for whales that sometimes they get caught up in mussel ropes. So the mussel fishers in South Africa have their ropes and nets.



And in previous times, when a whale was caught in there, it couldn't get away, obviously, and created a big problem. And nowadays, we monitor these ropes so that whenever a whale gets caught in it, it sends a message automatically to the fishers, they can go there, you know, take their nets away, resolve the problem, and the whale can go back into the open sea.

Phil Skipper 16:11

It's also proactive. So by being able to detect the whales using hydrophones in the water, we're able to detect when they're coming in, the fishermen can act early, and the whale is then able to avoid the problem. So it's not just solving the problem, it's avoiding it at the same time.

Tim Samuels 16:31

And I guess the same technology could be applied to poaching as well?

Erik Brenneis 16:34

Absolutely. That's something we've done in Africa already a few years ago, where rhinos are equipped with a device and the device actually similar to the cows, you know, which are monitored before they give birth. The device monitors and rhinos vital parameters, such as blood pressure, temperature, pulse rate and whenever they get into extreme stress, the sensor sends an alarm. And this extreme stress at night usually only happens when there are poachers around, they're going after the rhinos and then the device sends a message, and the rangers can actually see the exact location of the rhino, they can get there, protect the rhinos, and hopefully catch the poachers. So, something that has already saved many rhino lives.

Tim Samuels 17:25

You know, my conception before talking to you guys was that the Internet of Things was the smart fridge placing an online order if you're running low on milk, or your coffee machine ordering new pods that arrive and you don't even know about. And you've talked about things like meters and cars. I had no idea that rhinos were being protected from poachers, that whales were avoiding traps, and that farming in some of our most vulnerable areas was becoming more efficient. That's kind of amazing, really. All that's happening now. But if we look to the future, for what most excites you about the future direction of where the Internet of Things is going?

Phil Skipper 18:05

What's really exciting from around the Internet of Things is one it's showing no sign of slowing down. So, 10 or 15 years ago, we're probably doing 5 or 6 different applications, we're now doing hundreds. And the most exciting thing is where all of these different applications are now starting to combine. And we call this the Economy of Things. And this is where these devices cannot just transmit their data to one place, they can actually talk to each other. They can transact with each other. So, imagine, you're on a bike going down the street, you can take with you this bubble of connected things, the streetlight other vehicles to make sure that you're protected as you ride down the street. Now, this may seem a little bit fanciful, but we're already providing a step platform. And this step is an urban safety platform where it brings all of these services together. So, road users get early information about traffic congestion, other vehicles, accidents, and everything else. And with the Economy of Things, you're then able to transmit that data in a much more automated way.

Erik Brenneis 19:18

We're already seeing some of these being in place. For example, we have projects with the manufacturers of street lamps, where people as they walk by automatically switch on a street lamp. And when nobody is in the street, the light is just not on, you know, which obviously saves a lot of



energy compared to today, where the street lamps are usually on during a certain period, no matter whether somebody is there or not.

Tim Samuels 19:47

And I guess when applied to healthcare, there could be real gains here?

Phil Skipper 19:52

Absolutely. I think healthcare is one of those areas where we've seen an explosion in the use of IoT particularly over the last two days. For years, and that's in remote, telehealth where you can actually have consultations over the phone. But much more importantly, the ability for patients to have devices which monitor their health condition outside of the hospital. That means that people can spend less time in hospital, they can be back in the comfort of their own home. But it's like the hospital is reaching out to them so that care is still available in their own home by having an IoT connected device. If you then go back into the hospital, just think of all the CT scanners and the MRI, everything else which is connected, so that you can get information and diagnostics quicker and more efficiently than ever before. And I think healthcare is going to be one of these other areas where the IoT converges with artificial intelligence to actually process these huge amounts of data, work out the trends and work out the diagnostics. And we're already seeing that for many clinical conditions today.

Tim Samuels 21:05

Erik, paint me your utopian future, where IoT has really gone to the next level.

Erik Brenneis 21:13

When IoT has gone to the next level, and you step out into the street, you know, and you get into your car, the car is connected to traffic lights around yourself. So, when nobody else is there, you will not see a red light, because why should you, you know, the system will know up the only car driving on this road here is this one. So why let it wait at the intersection? You know, that's again, another example for this personal bubble that is connected to all the infrastructure around yourself, I think that is a big thing, which will make life for everybody significantly easier, and also a lot safer, of course.

Tim Samuels 21:53

Before we step out into the streets, and have the traffic lights and so forth, what will be the devices that we might be wearing, which might be embedded within us, you know, chips, which will be in our household devices, which will be interacting with and changing the way in which we live?

Erik Brenneis 22:12

A very wise man once said predictions are hard to make, especially if they concern the future, right? A few years ago, people thought those are probably going to be glasses. So, whatever is now in a smartphone you will have on your glasses, and then the virtual reality will merge with the actual reality. And it will be augmented reality, these things partially exist today already. Hard to tell how we will be connected to this and I personally believe that it won't be a one-time fits all because people are also different in how much they will want to participate. So, I believe, it will be the choice of each individual person to define how much IoT you actually want to use in your daily life. And it may even vary that you say, well, while I'm on holiday, I'm just going to do it the traditional way, I don't need my private IoT bubble. Whereas when you're writing to your job, of course, you want to do it as quickly as possible to use the example with the traffic lights. That's one way of looking at it.



Phil Skipper 23:16

Look at how people operate today, some people will get up in the morning, and talk to a speaker box and ask them what the time is. I don't, but lots of other people do. And I think there's going to be two environments, there's going to be almost the Public Service capability, in terms of traffic control, and environmental control and so on. There'll be your personal space about how much you want to use it in your own life. But the joy is, you don't have to. You use it for when you need to use it, you can make your own choice and I think that's the key thing about the IoT.

Tim Samuels 23:54

I guess some people are going to be concerned by the prospect of what you're talking about. It's all well and good when people are using these things for good intentions, but there are plenty of societies and there are some parts of the world already where technology has been used to suppress human rights to control people. How can we safeguard against this powerful technology being used against people?

Erik Brenneis 24:24

First of all, a lot of the IoT applications are actually about automating things and make them more efficient, such as water irrigation or reading out electricity meters and so on. Then when it goes more into personal things, such as creating your own personal bubble, you know, which then puts traffic lights on green when you drive towards it and nobody else is around. There is of course a lot of information about yourself like the location where you are in any given moment of time. So therefore, the systems today, they are built in a way that the user controls their own data. As a user, you decide which data do you share with whom, and for which purpose. And that's very important. And also, it's going to be the choice of everybody, whether and how you use such IoT systems.

Tim Samuels 25:18

Erik, you said are in fools make predictions. But if I can beckon you towards some foolishness, do you think that ultimately, we might end up as humans becoming things ourselves with chips embedded in us, and we are communicating with devices all around us?

Erik Brenneis 25:36

I don't think that humans will become things because I am a strong believer in humans being human. And like Phil said, I believe it will be the choice of people which technology you use. you know, look at the varying levels of social media that people use, many people don't use social media at all. Other people spend almost all their time in it. And I believe that in the free world, this will remain the case.

Tim Samuels 26:06

It's fascinating. But if we go back to the mid-90s, you're sat there with the internet, squawking and squeaking and pixel by pixel appears on your screen. So, the global transformation that you've been outlining, I'm now much better schooled in the Internet of Things actually quite excited. So, I look forward to never having to stop at a red light again.

Erik Brenneis 26:27

Me too. And we're working on that.

Tim Samuels 26:34

Thanks again to Erik Brenneis and Phil Skipper for taking the time to tell us about the world of IoT and its progression into the Economy of Things. I'm looking forward to a world still with salmon,



whales, but not so many red lights. Join me for the next episode of We Are Vodafone for more insider insights into the next big thing in tech. Until next time.