Enabling the Internet of Things: An interview with Ericsson's Ulf Ewaldsson

The Internet of Things is poised to change business and society — but not without a network to support it. In this interview, the chief technology officer of Ericsson describes how the Swedish telecom equipment maker is helping to usher in a new era of connectivity.

Aptly named and much talked about, the Internet of Things consists of the physical devices that can connect and exchange data, from the more familiar smartphones and computers to sensors embedded in everything from clothing and concrete to cars, industrial machinery, and home security systems. These devices spit out an unprecedented amount of information that has the potential to transform the way businesses interact with consumers and each other. The Internet of Things will quite literally change the world.

But while much of the management conversation around the Internet of Things focuses on the devices and applications themselves, today's network will not be sufficient to support unfettered communication among the devices and applications coming online. As of today, the Internet of Things is connected through a "network of networks."[1] Each network was built for a specific purpose, with its own capabilities, standards, and security protocols. To truly realize the potential of the Internet of Things will require both a network evolution and an evolution in the Internet itself. All of these disparate networks must come together to enable an unprecedented capacity for data collection, analysis, and transmission.

Telecom equipment maker Ericsson is on the front lines of addressing this challenge and upgrading the network to the fifth generation (5G). What implications will the Internet of Things have on business strategy across industries? What challenges do companies — and even governments — face? And what rewards may be in store for those who adapt best? Heidrick & Struggles' Kevin Anderson and Sean Carroll spoke recently with Ericsson CTO Ulf Ewaldsson to learn more.

[1] Cisco Internet Business Solutions Group (IBSG), *The Internet of Things: How the Next Evolution of the Internet Is Changing Everything*, by Dave Evans, April 2011.

Heidrick & Struggles: How will the Internet of Things change the way companies do business?

Ulf Ewaldsson: The Internet of Things is going to involve almost every company on the planet. This technology shift is monumental. I've heard it compared with the shift to electricity, and I think it's very similar. Electricity changed the way companies built their applications and their products. And it's going to be the same with the Internet of Things. Everyone is going to find their own ways of development, and many will thrive.

I could preach a lot about what it could lead to. More and more consumer devices are being connected. I was meeting with some people in the home appliance industry the other day. They are now looking at their next-generation products, which will be much more software-centric. We were talking about washing machines. They will be able to log every wash and the quality of the results, and they will be able to figure out what wash-cycle programs people actually use, and they will feed that information continuously to a cloud on the back end. And if there are issues with the software, they can push an update to the washing machines through the cloud.

Consumers will be able to buy applications for their washing machines, which means over time the user could actually change the things the washing machine can do. In fact, it's not hard to imagine that there could be more money in the applications than there will be in the hardware of the washing machine. I'm not an expert on washing machines in any sense, but for these product makers, and many others, this connectivity is the innovative freedom they have been looking for — for a long time. No matter the industry, businesses everywhere will need to adapt to the changing demands of these consumers.

Heidrick & Struggles: What role does the network play in making this future a reality?

Ulf Ewaldsson: On the consumer side, we're seeing increased demand for connectivity not only in very well-developed countries but all over the world. But consumers take the network for granted. Think of how easy it is to reach someone on a mobile phone. But you have to have an application on each end that is exactly the same to make a call. That requirement is a limitation. And we can't live with such limitations if we're really going to make the Internet of Things happen on a large scale, because it requires building a network for devices and applications of all kinds to communicate with one another.

While we have a substantial services business, we at Ericsson are the experts on network and network technology. Our role is to provide a platform for the Internet of Things and whatever applications the end users wish to run, on whatever kinds of devices they would like to connect, whether tablets, washing machines, motorcycles, or manufacturing equipment. We want to be the best possible network and platform provider, so we need to build the capillary networks that can reach every single device or aspect of a device.

It can sound abstract, so let me give you an example. The car industry is moving rapidly into digitization. So think of the whole car as a device, and that device communicates on a number of different levels. It communicates from the braking system without the driver knowing anything about it. It also communicates from the people sitting in the backseat of the car watching a Netflix movie. All of this means that the car is constantly connected to a number of back-end clouds that supply it with information for whatever is happening.

Of course, that's producing an enormous amount of data because the data come from the individuals using these devices and from the devices themselves. Everyone who's making a device has it connected through the network to a cloud somewhere, and

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Vice President and Head of Product Area Radio (2007–2012)

that cloud is the back end of the application they have developed.

Ultimately, I think the companies that excel will be those that build network businesses into connectivity businesses, where you have partners in applications on one side and the devices and the consumers on the other side. Of course, it's easy to say that but hard to see just how it will happen.

Heidrick & Struggles: What are the implications of the Internet of Things for Ericsson?

Ulf Ewaldsson: I think it's a huge opportunity, but one thing is very clear: the companies who were winners before this shift happened are not necessarily going to be the winners after, and that goes for Ericsson as well. Therefore, it's extremely important for us to keep on our toes so we understand what the Internet of Things will really mean for the networks of the future.

We believe firmly that the network itself has to be upgraded to accommodate this future. That upgrade is the upgrade to 5G. And that upgrade will include a quality of service, a security level, a performance, a latency, a throughput — all of these things that are related to the kind of quality of service that is asked for by the application on the device, whether the device is a car or a refrigerator or a television set or whatever. So functions like connectivity between two points and so on, that has to be solved in the 5G context.

We are already cooperating today with a number of industries that are looking at the industrial applications of 5G mobile technology. We are involved in the mining industry, the electricity distribution industry, and transport and automotive, and we're also looking at manufacturing and robotics, to mention a few areas.

There is a very high interest in industry automation and factory automation — not just to do things like simply create a WiFi network in a factory to control the robots but to actually connect them over the larger network and be able to remotely control all of that from a cloud that's perhaps really far away. Ericsson is very excited about the kind of momentum we are creating with digitization, with 5G, with the possibilities of all of this new technology. We are excited to be a technology company leading this evolution.

Heidrick & Struggles: What are the biggest challenges you see with respect to the Internet of Things?

Ulf Ewaldsson: We're leaving the era of traditional mobile telephony and are now moving into an era of networks and connectivity — a networked society on a whole new level. And that requires new ways

of standardizing network development because the performance has to be more guaranteed than ever before and because there are huge security implications in creating tunnels between all of these kinds of devices and all of the clouds on the other side. This network needs to be predictable, programmable, and high performance. It needs to live up to what these applications will require. I think this is the biggest challenge in a very long time for networks.

Because the development needs to be multivendor, it's very, very important that the network protocols are standardized. Therefore, we have to work in a much more industry-driven, standardization-driven, and open atmosphere to make this happen. That is challenging too. And it's not enough just to have the Internet protocols, if you will. That's just one layer. Below that we need operating systems; we need performance on routers, on base stations; and we need the mobility piece in itself, which is very complex.

To really make it work, the network's world and the world of over-the-top (OTT) applications[2] have to find an equilibrium where they can cooperate and send data between each other. Today you cannot always use that data because it's under regulation. But much of the potential to society of the Internet of Things — for example, connecting isolated, disaster-struck areas to outside help — depends on operators being able to send data to one another.

Heidrick & Struggles: How else does society stand to gain from the Internet of Things?

Ulf Ewaldsson: I'm an extreme optimist about the human use of this technology. We have had times where technology has hit us in different ways, but we always have been alert on risks and we have been able so far in mankind's history to cope with it, to find good solutions. Of course, privacy and cybersecurity are key issues when it comes to the networked society.

I must say that I don't envy regulators in this world. Regulation of the world's future opportunities in these areas is going to be the most difficult thing to do because it relates to questions of democracy and freedom of speech. It's much harder than just network technology.

But the potential benefits are so clearly worth the risks. The networked society benefits consumers, it benefits business, and it benefits society in general. Here in Sweden there is a hot debate on how we can make the public sector much more efficient. It hasn't been very long since we began talking a lot about e-government and building a sustainable society. The piece that we focus on at Ericsson is really then how do we create the connectivity to make it happen?

Heidrick & Struggles: How do the changes associated with the Internet of Things and other network-related technologies look from *within* Ericsson? How do these changes compare with others you have seen?

Ulf Ewaldsson: Change is good. I look at our history, and the more you read about it, you would be fascinated by how much change has happened over this time. But when it happens, you also have to find a way to lead change in the company. At Ericsson, we talk with our employees about how change is in our blood; this has happened many times before.

Ericsson has been a communications company since 1876, so that's 140 years in 2016. We've been in communications, essentially, since it became an industry. What we have been doing in terms of network technology and communications will be even more relevant for civilization to continue, for civilization to be able to find a sustainable way of continuing the way it is today.

2 An over-the-top application is one that is delivered over the Internet, such as a streaming video service.

To illustrate: We started as a telegraph company the same year that Alexander Graham Bell invented the telephone. It took just two years before Ericsson shifted over to phones. We moved quickly. And then all of the phones became connected, and we went into switching and so on.

What followed was computer technology, which did not come from Ericsson. In the 1950s, there were people in the telecom industry saying, "This is going to affect us; this is going to be something we need to embrace in one way or another." At the time, Ericsson was almost completely mechanical — the switchboards were electro-mechanical. In only 10 years, from 1965 to 1975, the whole company transformed into delivering computer switches. In terms of R&D, that meant our staff swung from being almost entirely mechanical engineers to almost entirely software engineers.

So those kinds of shifts are pretty normal in our company's history, and we can comfortably explain to our people again that these transformations are very big and we've done it before. ■

This interview was conducted by **Kevin Anderson,** an alumnus of Heidrick & Struggles' Dallas office, and **Sean Carroll** (scarroll@heidrick.com), a partner in the New York office and a member of the Global Technology & Services Practice.

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