

Sue Nelson

Hello, I'm Sue Nelson and welcome to the Create the Future podcast, brought to you by the Queen Elizabeth Prize for Engineering. Celebrating engineering visionaries and inspiring creative minds.

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Today's guest has combined an engineering background and entrepreneurial spirit to forge a career path encompassing consultancy and becoming a CEO of the world's leading lighting company. Canadian Stephen Rouatt is the CEO of the UK and Ireland markets for Signify, formerly known as Philips Lighting, the company began in the Netherlands over 125 years ago. And the chances are that if you've ever bought an indoor or outdoor light whether filament, LED, or halogen, it was probably one of theirs. Stephen is also a member of several World Economic Forum Committees related to engineering and construction, infrastructure, and urban development. So it will come as no surprise to learn that his degree is in civil engineering. And his childhood involved both an entrepreneurial interest and certain games, beloved of budding engineers around the world.

Stephen Rouatt

Growing up, I probably used more LEGO, Meccano, anything, you could basically get your hands on the build, I was basically fascinated by sort of as a kid. And then I'd say, importantly, I had an uncle who had an Amiga computer, which he let me start playing with as an early teenager. And I probably couldn't let go of it. It was really interesting and fascinating for me just sort of the technology within it. And he was writing video games at the time. I was just fascinated by the whole thing. And then to be fair, I was just lucky that my dad also was one of those people that was constantly fixing things, we had a cottage that there always seemed to be something to fix. And then to be fair from an entrepreneurial standpoint. My father started his own company, probably when I was about six or seven years old. And so, I basically just grew up in a family of entrepreneurs. So constantly learning the pressures and challenges of running your own business, and just how to be creative to make it work.

Sue Nelson

So was that sort of interest in building creating things led you to study civil engineering?

Stephen Rouatt

I found all engineering really interesting. And it could have been computer civil. My grandfather had actually been a materials engineer. And so engineering itself look really interesting. So, I went to the University of Toronto and a couple of other universities, kind of like away days you go for the weekend, you check it out. And I just found everything they were trying to do really fascinating. All the programmes interesting. And actually the people were really interesting as well. And I said, "Okay, engineering is the place for me". And then it was a question of which discipline and for me, I really enjoyed buildings, architecture. And, I guess my love of LEGO at an early age said, "Okay, let's go with civil". And that's why I got started.

Sue Nelson

When you did your masters, I saw that you take in an entrepreneurship option, obviously, where as you say you grew up surrounded by entrepreneurs. But what did that entrepreneurship option include?

Stephen Rouatt

It was a combination of engineering, some maths, but really business and a commercial mindset. And so for me growing up with a love of engineering, with an entrepreneurial family, it was a great opportunity to kind of apply engineering and maths in real world problems. Because we had the chance to work with large commercial enterprises. We were sponsored by some of the big banks, one of the major telcos. And you got to work with real people on real problems as part of your research. So this was really fascinating for me while also working

on a bunch of technology and computer stuff. So, it was a chance to go from civil to kind of entrepreneurial and technology,

Sue Nelson

And also incredibly useful for engineers, so many of whom go into setting up their own businesses, as well. Was that ever on your mind? Like "I will use this option to learn how to set up my own business?"

Stephen Rouatt

Absolutely. This was back in the dot com era when I think everybody was starting their own business of something and it's something that's still on my mind in terms of you know, my family still has their own business that's been quite successful. The question is, for me, at some point, would I ever go off and do my own business, not sure, I quite like being able to take a lot of the entrepreneurial learnings that I had from early on. And to be able to apply them in a large corporation is actually quite valuable. I don't need to leave just yet to start my own company, but it's something that's always sits in the back of my head.

Sue Nelson

What was your first job then from leaving university?

Stephen Rouatt

My first real real job, after university would have been with Accenture, the consulting company and I was working on in their technology Strategy Group.

Sue Nelson

And what did that involve?

Stephen Rouatt

It was actually a really cool job. So you've got to basically travel around the world. In this instance, I first started off working across working across North America, working with senior executives on technology related problems. So, either the CEO would hire you in to solve kind of a really help better understand to get the value out of technology to really transform let's do the architecture of the company, or drive more revenues out of technology, or be hired by the CIO, in some ways to combat the CEO or to help them better prove the great work they were doing, or really just transform their business.

Sue Nelson

And this form of consulting effectively, did what you were trained for, make this sort of area and this avenue and direction come easy to you?

Stephen Rouatt

Yeah, absolutely. Engineers make often great consultants, and whether that's with the big four, big five, whether with the Bain's, BCG's, and McKinsey's or the whole broader range of consulting roles that exist out there, engineering teaches you problem solving, working in teams, numbers, and you really apply all of those things in a consulting role. So, it was literally hand in glove for what I wanted to do.

Sue Nelson

I was quite interested when I was sort of researching your career in terms of how while you were working as a consultant, it looks like you still kept up that interest in engineering in terms of being involved with quite a lot of engineering committees and leading national engineering conferences. I mean, that sounds like a sort of deliberate, you wanted to keep those things in parallel.

Stephen Rouatt

Early on. So while I was in engineering, I was heavily involved in the Engineering Society also with arranging the, in Canada, the National Engineering Conference, and I'd say, I've always tried to stay in touch beyond just the day to day work that I've been involved in into larger things where you can make a difference, let's say outside of your existing role. So now I'm currently involved in the lighting Industry Association. I do work with the World Economic Forum, UK Green Building Council and so forth, really to provide an outsized role outside of just what I do day to day to have a bigger impact on society, industry, to kind of have more positive benefits. So it's something I've always tried to do more of.

Sue Nelson

Do you now, you know, with all that experience behind you, can you sort of tell instantly, whether organisations are going to sort of rise or fall?

Stephen Rouatt

Well, if I could do that really well, I would probably be working for a large-scale investment firm and picking all the winners, it's hard. You really see, companies come up with great ideas, or individuals can come up with great ideas, and they never, they're never able to commercialise them or it takes two or three goes before you get the really the right model that lands. Philips is a great example of coming up with a whole series of great innovations that they didn't necessarily, they weren't necessarily the first to market with commercialising them and others potentially more successful. It's really hard to be able to predict what's going to be a clear winner. Blockchain is a great example. It's going to work the question is how and how is that technology going to be best applied, and what's going to be the most interesting set of use cases that really help it take off, so it's hard to pick winners, you can get a general feel for it. This looks like something that's going to be a winner over the longer term, but who the individual that actually picks up the solution, gets the first business case right, gets the first set of customers right, and then runs with it. It's always hard to guess.

Sue Nelson

And Philips Lighting, which is now known as Signify, is that one of the reasons that attracted you to join the company because you saw the potential there?

Stephen Rouatt

Oh, absolutely. Philips has been around for about 130 years. So Philips Lighting, now Signify for the group that I'm part of. And obviously, we're one of the first manufacturers of light bulbs, but then really extended it into a whole range of different solutions, different products and whether that was the Compact Disc player, audio cassette tapes, they have a whole set of personal product divisions and so forth. They have a such a broad range of interesting technologies and different product areas. And a huge historical focus on innovation. So the chance to work there, and a business that invests so much into innovation and has such a culture of creating the new was really interesting for me. So that engineering, that engineering passion that I had moving from financial services, which is more digital products to Philips, Philips Lighting, and now Signify, which is more, let's say physical products was really interesting for me.

Sue Nelson

And as you know, this year five engineers who played a role in LED lighting innovations were the recipients of the Queen Elizabeth Prize for Engineering. It can at first glance, I think seeing that the way we illuminate are just a simple thing, like lighting up our rooms, hasn't changed that much over the years, but actually, there has been a lot of innovation and engineering in terms of where we were then and where we are now hasn't there?

Stephen Rouatt

Oh, absolutely, you know, you can go back to, they always say 1015 is when even Ibn Al-Haytham, I'll never get his name right, had the book of optics in 1015. And then you really see the evolution of the thinking and engineering around lighting, the nature of light, magnetic waves, the use of optical fibres, culminating into the first filament light bulb more than 100 years ago. And then since then, you've gone from, let's say 10 lumens per watt, from an efficiency standpoint, all the way up to 200 lumens per watt and more. So, from an efficiency standpoint, lighting has changed so much in terms of its power output, its efficiency. But more importantly, as it's gone from conventional incandescent to fluorescent and HID, and now to solid state and LED lighting, as part of this whole evolution, the applications for lighting have grown multitudes, you know, you can take a look at how lighting used to be, if you think back to 25 years ago, 50 years ago, you'd have one light point one light in your room. So, you'd have a desk lamp, or you'd have a light on the ceiling. That was it. And now if you look at any room now, there might be 10, 20, 30, 40 different lights and being used in different ways, whether it's light strips, lights embedded in products, obviously, lights in your ceilings, and so forth, and how we use them has changed as well. And now, instead of lighting just providing pure illumination, it's also used as a signalling method, you can use colours to shape ambience and to actually provide a physical feeling for people. And that's just in the household in the office space. So, what you have now is with human centric lighting, where light actually imparts a feeling or behaviour on you, it helps you get over jetlag quicker, it helps you be more relaxed, and you can have the light change over the course of the day to make you more energised or more relaxed. So that works for people, as I said, in offices and home. But lighting can now be used for things like agriculture, where you have horticultural lighting, and whether it's in a vertical farm, or in a greenhouse, helping plants grow more healthily, quicker, really improving the overall efficiency of agricultural production. So, there's a huge role to play for lighting in the coming years on making agriculture more efficient. And the same goes true for animals as well, where it can be used to basically help, whether that's pigs, chickens, cows, and so forth, be more relaxed, grow more quickly be more healthy, all the way through to basically plants, animals, people lighting has an impact on all of those. But then you also have things like ultraviolet and infrared lighting. Ultraviolet lighting actually has been quite handy for disinfection. So, it's been used throughout the years for everything from tanning beds to killing insects in one of those little bug trays. But now you can use ultraviolet lighting as a disinfection tool for combating things like COVID, SARS, MRSA, the superbugs, influenza and so forth. So, you can really see how lighting has gone from just lighting a room to providing physical benefits for people, plants and animals to these new applications around disinfection. And I'd say probably one of the more interesting ones is using lighting for the transmission of data, Li-Fi. So you can actually use a light bulb, a specific light source, LED all the way through to infrared to be able to transmit data, and you can get up to, you know, one gigabit 10 gigabits a second. And we're now seeing all sorts of interesting use cases where we're using lights to transmit data. And whether that's in the home, the office, there's a lot of commercial opportunities as well across aerospace, defence and so forth. So, lighting has gone from this, this very simple light the room all the way through to some of the most interesting applications possible for the coming years.

Sue Nelson

That's fascinating, isn't it? Obviously, the increase in the use of lighting particularly within the home, how do you balance that with the desire to be more energy efficient, particularly with people concerned about climate change?

Stephen Rouatt

And that's been one of the great things about the evolution. of lighting. As I mentioned, we've gone from 10 lumens per watt to 200 lumens per watt. And once you factor in things like systems or controls that allow you to have the lights on only when you need them, for example, when you step into a room or at the you know, motion sensor detects you, when you take a look at, I'd say maybe 10 years ago, lighting took up about 18-19% of all electricity usage worldwide. Now, over time with the introduction of LED lighting, and these systems and

controls, that's gone from about 18%, down to 13-12% now. So even though there's more light points, we're using less electricity for them. And when you take a look at the numbers, the belief is that over the next 5 or 10 years, we can get that 12-13%, down to about 8%. So actually, LED lighting has been a phenomenal contributor to actually reducing the total amount of electrical usage worldwide. And it's one of the easiest ways to make your home more sustainable, because you can basically replace all your conventional lighting immediately. And you'll see that you just screw in a new light bulb, and you'll see a substantial reduction in electricity usage, you basically go from about depending on the light bulb you've got in there, anywhere from 50 to 70% reduction in electricity use. So actually, as an end consumer, or even in an office space, or anywhere, switching the light bulbs out, switching all the lighting that's in your house or in your office to LED lighting, and then putting in some controls over top can actually help you become more sustainable. And it's probably one of the easiest things to do versus replacing a boiler or putting insulation all around your home.

Sue Nelson

Will those future reductions come from engineering refinements of existing technology or will it require another sort of step change?

Stephen Rouatt

With the current set of technology, so LED controls, the belief is to get it, it's possible to get from that 13% to 8%. I have no doubts that further potential beyond that is available. If you think about improving in the materials, the electrical controls tied to that, we've already seen you know that that lumen per watt going from the 10 to 200. You know, going from 200 to 300, in a commercial option is very much there. So, when you think about material engineering, electrical engineering, a lot of manufacturing processes, there's a lot of places where engineering will have a role to play in driving lighting to being even more efficient. I have no doubts of that.

Sue Nelson

And you've worked across the world, you've travelled a lot. Do you notice any difference between different countries attitudes towards engineering?

Stephen Rouatt

That's a great question. I would honestly say that most places I've been across the world engineering, has is often regarded as a profession with a degree of study, an area of study that's interesting, has a good reputation, you know, like medicine, you know, it's one of those things where everybody likes doctors, they provide a societal good. The same is true for engineers. everybody appreciates the benefits, from what I've seen, at least, that engineering brings in regardless across the world. Obviously, in some markets, engineers are held to a higher standard or a higher regard, and have a stronger place in society. But I'd say pretty much everywhere I've seen that everyone's gone, "ah, engineer really interesting".

Sue Nelson

And how do you relax.

Stephen Rouatt

I've got a couple kids, I think that's called relaxing. For me personally, and I think it is really important that every person really finds ways to have those personal timeouts and just have something other than work. You know, I'm sure Elon Musk takes two minutes off a day or something for something other than work. But for me, sports has always played athletics has always played a strong role or been a strong, very present in my life. And whether that's basketball, baseball, skiing, I've always tried to do lots of sports, in that sense, spending time with family. And then actually something that I've had to do as part of my work has been something that I've

always loved. I've loved travelling, I love seeing different cultures, languages, food, photography. So, I've been fortunate that, you know, my career over the past years has really allowed me to go around the world and actually do a bunch of my hobbies. So, if you happen to be working in the Middle East, having your camera with you, and really being able to go out and meet new people, try the foods and just explore the area has been a great way to detox and take a step back from whatever work that I'm deeply involved in at the time.

Sue Nelson

And what advice would you give to engineers who also see themselves as going down the route that you've gone in terms of consulting and then eventually CEO and more on the business side of things?

Stephen Rouatt

So, you made a great choice. Firstly, engineering is a great base to step into a commercial role, I would really encourage you, while you're in your studies, definitely read the business newspapers, be involved in things like engineering competitions, I really find that getting from theoretical to applied, regardless of discipline was really critical in just, you know, helping shape a lot of the problem solving and putting things into action that you eventually need in the commercial world. Really get work experience early, summer job, part time job, anything just to really just get your feet wet from a commercial standpoint. And then I'd say importantly, great, you've stayed in touch, you've kept up to date on the way the world works, all the business newspapers, really being involved in a lot of the applied parts of engineering that there is, as part of that first job, really pick a place where you're going to learn, there's some really cool jobs that are good for the job itself. But I think it's really important to try and pick a job that helps set your base for a career. Obviously, consulting was one of those, and it's not the only profession you can go into. But consulting for me really set a great strong base for seeing a broad range of companies, a broad range of problems, working with a broad range of people. And really always being acutely aware of that commercial business case aspect that all companies drive themselves by. Obviously, you could learn that in many different environments. But for me, really finding that first roll out of out of university was really critical in terms of setting the base that I could build a career off of for the longer term.

Sue Nelson

And as CEO, I suppose I have to ask, former consultant, have you negated the need for consultants now for yourself and your company?

Stephen Rouatt

No, actually, consultants are useful, they need to be used the right way. I've seen a lot of instances, both while I was in consulting, and as somebody who's hired consultants, where consultants haven't been used the right way they've been misused, they brought it in to solve the wrong problem, where you're not quite sure what problem it is to solve. It is phenomenal to be able to bring in, whether it's three, 5, 10, 15, super smart people with a broad range of experiences, who seen a specific problem elsewhere, you're a company, you're struggling with a problem, you've not solved it yourself, you've not seen it yourself, being able to bring in 5 or 10 people who are dedicated and focused on that specific problem, and can bring relevant examples and experiences from wherever they've come from, especially if it's from different industries so, you can bring in these new learnings really can bring a phenomenal benefit to a company, help them make a step change, especially if they're doing a new business, launching a new set of products expanding into new area, or trying to improve in some way they haven't done before. So, it's a great way to learn. Now, of course, you can do it the wrong way. You already know the answer. Your kind of just looking for somebody to rubber stamp it, you know, the team that's brought in really don't have the experiences, they may be three or four really smart people, but you know, they kind of haven't done it before. So, they kind of end up playing back to the same answer that you always knew. The old analogy of, they'll basically take the watch off your arm and then tell you what the time is. That's how it can be

done wrong. So important is really have the problem in mind, really say we need to use an external third-party because they're going to bring the expertise and knowledge that's going to help us crack it because we don't know it. And we're looking for very specific information, you really vet the company that you pick, and then you can really have a very strong positive impact from using a third-party group like consultants.

Sue Nelson

Stephen Rouatt, thank you very much for joining me on the Create the Future podcast.

Stephen Rouatt

Thanks, it was really great to be here.

Sue Nelson

Find out more about the Queen Elizabeth Prize for Engineering by following @qeprize on Twitter and Instagram, or by visiting qeprize.org. This is the last episode in season 2 of Create the Future. We'll be back in January with season 3. In the meantime, catch up on seasons 1 and 2 wherever listen to your podcasts and tell us who you'd like to hear from next. Thanks for listening and do join me then.