



# **Mandy Chessell CBE**

Interviewed by

**Richard Sharpe**

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Via Zoom

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*Welcome to the Archives of Information Technology, erm where we capture the past and inspire the future. It is Tuesday, the 19<sup>th</sup> of April 2022, my name is Richard Sharp and I've been covering the IT industry, initially computing since the early 1970s. Uniquely, among those people who made a contribution to the archives, we have someone who is coming back and it's going to be well worth it. It's Mandy Chessell, CBE, and for 35 years, Mandy was in IBM, and she became a distinguished engineer in the hierarchy of IBM engineers and she is a software engineer.*

*And at 14, she heard a man from IBM because she was in Hampshire, in a school in Hampshire, describe what life was like in the computer industry and she thought, that's for me, and it was for 35 years. But now, Mandy, you've left, what are your first m-m-feelings about leaving IBM?*

[00:01:06]

Er, it's actually, in some respects it's a relief because there is a huge set of responsibilities that you have as an executive of a large corporation, erm, and so, of course, I've let those go. Erm, but on the other hand, I'm still working full-time on the Egeria Open-Source Project, I still lead it, it's still time... I-I-I'm still working every day, erm, and just to, er, make sure that I don't get bored, erm, I have started a new company with three friends to act as a consultancy around-for organisations that are, er, adopting the Egeria Project. So, it's sort of like taking that, er, open source Project to it-to its next space. So, I'm busy, but I'm in complete control of what I'm working on and things like that. So, it is an unusual retirement in that, you know, I'm not s-s-s-sort of, er, starting lots of new hobbies, erm, but I now am in complete control of my destiny.

[00:02:02]

*Can you describe to us, please, the Egeria Project? This is, erm, an open source project, open source is now very close to your heart indeed, and you fought for it in IBM, erm, against sometimes, erm, not overwhelming, but considerable odds and you won through and were successful in not only in engineering terms but also in providing products that make IBM money. So, what is Egeria?*

[00:02:25]

Okay, so, it-it, so, it's-it's, obviously, it's open-source, it's middleware and it's designed to provide a set of standards for metadata that an organisation needs to make broad use of its data to be-to be sure that its digital operations are t-transparent and-and, erm, operating efficiently, securely and all those sorts of things. So, if you imagine, er, erm, a more physical business where the managers can sort of watch the operations, they can see the factory working or however it operates. With digital operations, you can't see anything, and so, lots of things get left, erm, unmanaged or, erm, there-there are problems sort of down, you know, er, that-that nobody can see. And so, Egeria is about providing that very low-level infra-infra-infrastructure that keeps all the tools that an organisation is using up to date with the latest information about how their digital operation is structured, deployed, operating, er, etc. So-so, it's a very big project and that is why it's open-source.

It's not something that any particular company could do on their own, erm, and even if they did, it wouldn't be the right solution because organisations use technology from many different vendors, so, this solution has to work with many different vendors. And how do you build trust? You have open access, you make that technology-free, erm, you, er, ensure that you have top engineers working on that project so that it combines the best practices from the industry. And that's Egeria, that's, you know, it's why it's open-source and, er, it's why I-it-it's something I'm very proud of because the community is so excellent in so many ways.

[00:04:33]

*Who are the users, can you name some of the customers?*

[00:04:35]

[Laughs], erm, it-it's a bit difficult because some-some of them don't want to be named. Erm, but erm, ING Bank, is a global bank and they are, they have been staunch supporters of this from Day 1, erm, in fact, they have a large number of their developers on the project too and they're using it to drive their digital transformation. So, erm, yeah, that's er, the-I-I would say they were-they were the top people using it, but erm, but SAS, erm, SAS Institute you might know it as, is an analytics company, they are also firmly behind it, IBM is firmly behind it. So, there are, erm, er, er, a

small number of-of organisations who have really invested in this. Er, and there is now, certainly, since I retired, there is now quite a number of other vendors' popular names, I can't tell you because we're not at the point of disclosing them. But it, but it-it's their-their much happier working with me now I don't work for IBM. I think there was a feeling that it was too IBM centric. Erm, and we did our best but now, of course, I'm not tied to IBM so that makes things easier, erm, from a, er, a sort of openness point of view.

[00:05:58]

*You say you used the retired at least twice, surely determined transitioned.*

[00:06:03]

[Laughs] I don't know. I know, it's very, it-it-it is, a-it-it is, er, a strange word because you do get the idea of just sort of sitting putting your feet up when you've retired, erm, but I have so many friends who are retired from the corporate life, erm, and they're busy, and, er, you know doing many different things. So, I don't think of it is as not doing anything. I think maybe the full word is retired from corporate, erm, life, which is, er, you know, has been a wonderful experience, lots of, erm, I've done so many amazing things, learned so many, yeah, so, learned so much, erm, but it's just nice to finish my career in this sort of, erm, much more open style.

[00:06:44]

*What do you miss from IBM?*

[00:06:48]

Er, I think it's to-to-to be-to be honest because I'm still working on the project, er, you know normally you say, I miss my colleagues, I miss, erm, you know, I-I-I miss going places, but we're in a strange position because I'm still working with all my colleagues that I was working with before. And, er, the sort of the travel, the, erm, er, the going into the lab, all of that social side has been shut down pretty much due to Covid. So, the impact to me personally, is significantly less than it would have been if you know if we were—if the last two years hadn't happened. So, erm, yeah, I mean, I-I-I-it-it and it-yeah, I can't really say that there-there-there is very much I miss at the moment because the key things are still there.

[00:07:42]

*In your previous contribution, [coughs] you identified three levels or horizons of technology, erm, that you, erm, you used as a model in IBM, maybe you still use it, I don't know. I would like to have more explanation of that and ask you where you think, erm, the Egeria, erm, Project currently is. You explained you had Horizon 1, 2, and 3.*

[00:08:08]

Mm-hmm.

[00:08:09]

*3, I think was customer-focused, what was 1 and 2?*

[00:08:13]

So-so, 1 is where you have a new idea, you are proving it in the market and, erm, and so, you're looking for, you're looking for proof points, you're looking for one or two organisations to take that idea on and show that it works so that you have, erm, you know, you h-have, you have your, erm, cust-you-you-you have your-a sort of reference sites. Erm, and then you get into 2, where you're trying to build market presence. So, er, sometimes you're competing against another organisation and you're trying to get market share, so, there it is much more focused on volume, number of customers, erm, and, er, and-and so, often, you're spending a lot of time adding features, erm, publicising it, trying to create m-er, trying to get more and more people to-to build it. and then the third one is where you-you have a lot of customers, you-you're generally trying to keep them happy, making small changes but sta- stability is key, er, because they're not-they don't want to keep having to redo things. S-so, erm, it's, er, yeah, it's much more of a, erm, a nurturing type, erm, stage, in-in the project.

[00:09:43]

*And erm, a-a-and your current project is where, 1, I hope?*

[00:09:47]

Oh, very, early-very early, very early. So, erm, I would say it-it's-it's, we have some areas that have been in production quite a few years and we do focus very much on-on, er, on stability, backward compatibility as we move it forward. Performance is another key area in that space. Erm, if you think of it as an onion so that the very core piece is at that stage, then, erm, then we have, erm, other pieces that are very much, erm, in-in-in-in level 1 which is that innovative stage. So, we are working through used cases, working with different organisations, cr-cre-creating proof points for it, er, because it's very disruptive. It's disruptive in the way people think about tools and building products, erm, mo-most products in, erm, tools, yeah, tools and metal agent products are sort of, bring everything to my tool and I will solve all your problems. Erm, and that doesn't work for most organisations, they-they don't bring everything, they don't all go onto one tool. Er, you know, different parts of the organisation, different professions, erm, divisions in the organisation use their own tools. Erm, and so you get this siloed information. And so, Egeria is saying, "No, whatever tools you want, we will bring that information together and-and exchange it at that level."

So, there is a cultural shift and that is why, erm, it's, you know, it-it-it's still in that early stages, erm, plus we're still innovating around, er, different types of integration and making that integration as seamless as possible. So, definitely, area 1 and the whole thing with our consultancy company we will start to increase the number of people using it and get us to-to-to-to level 1... Level 2, sorry, we're trying to get to level 2.

[00:11:34]

*Just to-just to get the advert in, what is the name of your consultancy?*

[00:11:41]

Oh, erm, it's called Pragmatic Data Research Limited.

[00:11:46]

*Pragmatic Data Research Limited and you have a website, I imagine?*

[00:11:52]

Er, we do, we do, yes, erm, fairly simple at this stage, erm because most of the time we're still focused on the community, erm, around it. So-so, you know, our... The, er, the others are also, erm, building their skills energy area and keeping focus on that. So, our-our website is very simple compared to the Egeria website, er, but it will start to build up with different research papers and things that we do.

[00:12:22]

*How many people?*

[00:12:23]

Only three, just three to start.

[00:12:25]

*Three?*

[00:12:25]

Mm-hmm, yeah.

[00:12:27]

*Any other ex-IBM people like yourself?*

[00:12:30]

Yes, the three of us are all, er, distinguished, ex-distinguished engineers. So, er—

[00:12:33]

*But, er, you all work together, at Hursley?*

[00:12:38]

Yes, not at Hursley, no, no, no; it-it's international.

[00:12:43]

*And erm, you know work from home, do you?*

[00:12:48]

Yes, but, er, as I say, ironically, it's no different because due to Covid, I've worked at home for the last two years, er, so, yeah.

[00:13:01]

*You made an, erm, a very strong point about the fact that you're an engineer.*

[00:13:07]

Mm-hmm.

[00:13:08]

*Er, your father was an engineer, a naval engineer, er, so you told us.*

[00:13:12]

Yes, [unclear 00:13:12]

[00:13:12]

*Building battleships and naval, er, n-n-naval, erm, er, naval ships and so on and so forth. Erm, and you-you're going to be... We'll come onto that and I don't want to go that far yet, but you're going to be the, erm, honorary president of the Institute of Engineering Designers. Now, tell me, I think there is a bit of a problem about software and engineering, don't you?*

[00:13:32]

Mm-hmm.

[00:13:32]

*How do you put those two together; you're not building bridges?*

[00:13:35]

Mm-hmm, but you are building complex systems that are increasingly safety-critical, er, there are, erm, you know there is a method, there is certainly skills and processes and best practices involved. Erm, and so, the engineering mind of providing practical solutions to real-world problems is true in software engineering as well as-as



well as, er, civil engineering, so, there is a lot we can learn from each other. And the biggest thing is, if you think of a scientist, they focus on one particular aspect, they become deep experts in it and they understand its behaviour. With an engineer, they- they-they're building a system, and so, it requires systems thinking rather than, erm, sort of very deep, deep, deep knowledge in a particular area to know a wide range of things. And you make it work for people and for the real world. So, yeah, I think, erm, increasingly, software is part of our world and, erm, software engineering is a very key part of engineering.

[00:14:54]

*What did you do in terms of AI development in IBM?*

[00:15:01]

[Laughs] so, most of what I focused on was enabling it around data management. So, erm, and this is really wh-the, erm, where the impetus for Egeria came from. So, er, if we go back to about 2013, there was a thing called big data and it was, er, as the world was increasingly digitised, there was more and more data being made, digital data being made available. Erm, and so there was thought, well, erm, well actually, at the same time there were, er, new data platforms, erm, Hadoop being one of them that was made available, that worked off files. Erm, and so, there was a-a belief that we could start to understand the world by processing this big data. Erm, and with the- with our industry, as you know, we go through periods of amnesia. And there was a belief that because there was so much data, we didn't need to do all the traditional mechanisms around managing quality and having a metadata catalogue and thinking about schemers and structure and meaning and all those sorts of things that are some of the key capabilities around data management.

Erm, and I was working, erm, with a lot of customers at that time, talking about how they did this amazing thing called big data. Erm, and many were in regulated industries and, erm, so, we actually started to sort of talk to them about it and they were terrified, that they were going to build these data swamps, they were going to throw all their data into Hadoop and, erm, you know, and-and they were worried how they were going to manage it.

So, I worked on an architecture, erm, it was initially called the Data Reservoir Architecture that talked about how you did-how you worked with big data but also managed quality, er, governance, etc. where you needed to. So, it-so it was a very much a, erm, a sort of very flexible approach to it. Erm, and, er, at that time, er, I worked with about a hundred different organisations from all different industries. And, er, there's general agreement that the architecture I had-had done was right. Erm, and erm, but it was very hard to implement, er, because there weren't software products and platforms to actually do this. Erm, everything was very localised, erm, most technology focuses on a functional area and, er, and makes it very difficult to-to manage data. Er, and so, that set of requirements from those hundred-plus customers is what, erm, went into the Egeria design. So-so, my own big thing that I've-I've worked on around, erm, AI, is actually, the provision of that wide range of data, erm, a-across an enterprise.

[00:18:17]

*Erm, the-the philosopher, if I can call him that, Nick Bostrom, have you read his book, Super Intelligence?*

[00:18:24]

No.

[00:18:24]

*He, erm, it-it-it's a good book, I'm not sure you should read it, but it's a very interesting book.*

[00:18:30]

Mm-hmm.

[00:18:31]

*He suggests that AI will create a superintelligence, one which will actually ramp up and become-- better the intelligence of the most intelligent human beings, even when human beings act collectively.*

[00:18:45]

Mm-hmm.

[00:18:46]

*And there will be a take-off point, and at that point, we need to know what we're going to do, are we going to pull the plug, erm, are we going to be able to restrain it? Er, he thinks we aren't going to be able to restrain it, do you think it's possible that AI can, by itself, but with human assistance, create a superintelligence?*

[00:19:14]

Mmm, so-so-so, it-it's the word never is always very difficult when it comes to—

[00:19:22]

*Sorry?*

[00:19:21]

Er, the word never is n-n-not a good word to use when you—

[00:19:25]

*Alright, yeah, yeah.*

[00:19:26]

Yeah, yeah. So, the problem is that these are words that have a very loose definition. So, most really good AI, is actually a combination of human expertise and machine expertise and there are things that we do well and there are things that machines do well. So, when we work together, we do create a greater intelligence. When we collectively work... When-when you have-when you-when you're able to bring people with different skills on a problem, erm, we create a greater intelligence, and the way the Covid vaccine was created was an example of that network effect. So, I would say that, erm, we are already collectively, through our linking and IT creating a greater intelligence in-on the earth, compared to what we had 200 years ago. We're already doing that and i-i-is that combination of data processing intelligence and people. Er, so this question whether it's a thing you can turn on and off, erm, it's, er,

I-I-I think it's much-I-I think it's as I say, much more of this collective network that is the intelligence and bits of it will come and go, erm, so, turning it off, very hard.

[00:20:56]

*You had a teacher who had a big impact on you, you said, and she taught you about agricultural, industrial, etc. revolutions.*

[00:21:10]

Yes.

[00:21:11]

*Er, a-and that, erm, in the early stages, they go through a turmoil stage, where-where there is a lot of disruption. Are we in that stage about AI yet?*

[00:21:25]

We're certainly in a disrupted turmoil, [laughs] a disruptive age at the moment. Erm, and it's not entire-yeah, to-to me, this disruption is around, erm, pow-lawyers powers, normally it is, erm, but th-but things are changing in terms of the power of national governments as opposed to, er, more global organisations. It is very hard for a particular country to be isolated. Erm, but you know, but there are always obviously people who would rather that was the case, erm, because problems seem much more solvable, at the national level rather than an international level. So, yes, I think we are in a very-in-in a time of turmoil. Erm, what-how exactly that will be characterised going forward, but, erm, as we know, there's-a lot of what the turmoil is, er, the-the sort of political turmoil is caused by an inappropriate use of AI, erm, the fact that people are being isolated in the knowledge they see. Erm, so, you know, so, i-i-information is not as freely available, it's very... You know people are-are kept in bubbles, erm, and we're seeing the impact of that, erm, that isolation of knowledge.

So, one of the things we all need to learn how to do, is how to break out of the bubbles and I think it's, you know, that-that, erm, people-that-that we're trapped in, we're all trapped in our own information bubbles. Erm, and so, that's-that's the-the learning that we're all going to need to do to get out of this disruptive phase, 'cause

otherwise, you will end up with a very, erm, divided planet, erm, because we'll all have our-our different versions of the truth.

[00:23:16]

*There seems to be, erm, a possibility of a golden age in the breakup of the USSR, erm, and yet now, if you look, erm, I suggest to you there are actually many more, not just bubbles, but really hermetically sealed areas; most of China, all of, erm, most of Russia now, all of North Korea, a lot of I-Iran, etc. etc. These are becoming... I wouldn't call them dangerous states, but I would call them, certainly not states in which there is a free interchange of-of information.*

[00:24:09]

Mm-hmm.

[00:24:10]

*That's a danger is there not?*

[00:24:13]

Er, well, whether there is a golden age, or whether we're just still on this process of opening up, I, erm, I mean, how long ago was it when people didn't talk to anybody outside their own village? Erm, it's not a new thing, that the internet, this global access to information is not a new thing, erm, we're still learning and, erm, it-I think it's increasingly hard for a particular country to isolate people. Er, but there is still a long way to go, erm, to when, erm, to where that information is much more globally available. So, I know, I-I-I just think we're still moving in that direction and, er, it's better all the time, different areas go up and down, but, er, there is more information available, erm, as time goes on.

[00:25:04]

*You do take a long view of history, don't you?*

[00:25:07]

[Laughs], well, yes I suppose because things do take hundreds of years to change, and er, erm, you can just sort of take, you know, you can take a snapshot but actually, really, it's only as you look back, you start to see those patterns.

[00:25:35]

*Er, among the hosts of, erm, honours that you've received, honorary doctorates from, erm, many universities. You were named Innovator of the Year in 2021, was that for a-a particular innovation?*

[00:25:54]

Er, I'm trying to think which one that was, is that--?

[00:25:57]

*2012, I'm very sorry, 2012.*

[00:26:00]

2012, erm, is that, erm, the Women in Technology one?

[00:26:07]

*Cisco, I think.*

[00:26:08]

The Cisco one, yes. So, erm, that was... I'm trying to think actually, I think that was actually more generic because I've got a lot of patents, erm, and published a lot of books in-in this area, so, I-I think it was more general.

[00:26:24]

*You're going to be the, erm, honorary president, yes?*

[00:26:29]

Mm-hmm, yes.

[00:26:29]

*Of the Institute of Engineering Designers. Now, this institute was established, erm, in-in-in the mid to late 1940s, what is its objective?*

[00:26:39]

So, the product design, it-it's for product designers, and so, these are people who build the products that we use every day, so, they're very focussed on usability, safety, erm, and that human interaction with, er, er, with the product. And, erm, so, yeah, it is, to-to me, these people actually, er, are very strong engineers, erm, the-the interest and the wide range of, er, projects that they work on is phenomenal. And the, yeah, it-it's a really great, er, group to work with because it-it's very easy to see how effective they're being, erm, and-and how they work.

[00:27:22]

*One of the great things I saw on their website was, er, some group of engineers have produced very small robots that can go into your lungs, and right the way through, erm, your lungs, and pick up information and data and send it out again. That's really something, isn't it?*

[00:27:45]

Yeah, well this is-this is the thing, so, they're working on the smallest things you can think of and the largest things you can think of, you know, so, er, huge boats and, er, and-and all sorts of things. So, er, it-it-to me-to me it's a very visible aspect of engineering.

[00:28:00]

*And one of the things that normally people, who, erm, become president, h-h-how, is this for a year?*

[00:28:07]

Two, two years.

[00:28:08]

*Two years. What are your-what's your agenda for these two years?*

[00:28:12]

[sighs] interesting, so, I am interested in how software interacts with products. So, if you think about the data that is being collected with the products that we buy, vacuum cleaners, all sorts of things now, we acquire and-an-an-an-an-and exchange with the internet. So, how do we bring software into the physical engineering space? How do we think about the software aspect of the product and the usability around it, erm? Yeah, that's-that's really, erm... Because at the moment, you-you've got people who are sort of software engineers who are a very long way away from those commercial product-type engineers; so, how do we bring them together? Erm, I'd like them to all understand a little bit more about open source before I go. Erm, so, yeah, that-that's the, er, that's the thing I'm very interested in. I, er, with software, we do a lot of work with usability, but usability in an ecosystem, certainly, that is something that we've had to a lot for Egeria. Erm, and that also interests me, so, not just the individual using the individual product, but the ecosystem of people who use related products together, erm, particularly where software is that connection.

[00:29:37]

*Many years ago, I went to MIT, and, erm, the-the media lab there, and heard the likes of Negroponte talk about what we would now call things that think, erm.*

[00:29:47]

Mm-hmm.

[00:29:48]

*I-I have been, I wouldn't say disappointed, because I didn't have much, erm, regard for it, but, erm, I-I have been amazed at how slow that process is to develop, have you?*

[00:29:59]

Er, so, some things, are-are getting better, but erm, no, I think it's a hard problem, and er, erm, so, no, not so surprised. Erm, I think there's something... The thing that's hard for us to let go of is the concept of a centralised computer whereas from many things that think and for them to be effective, it is much more of a network, an agent-



type model of programming and that is not something that, erm, that's something we're still learning how to do, I would say.

[00:30:51]

*Is there a big, erm, block somehow or will that be overcome in time; are you putting your engineering head on and say, okay, we-we'll get over this, we'll solve this?*

[00:31:05]

Mm-hmm, there's also a commercial side to it too.

[00:31:08]

*Go on.*

[00:31:08]

Erm, you know, a-a-a big company with a big product, a big, centralised product, easy to put on the cloud, all those sorts of things, erm, you know, that's the way we've traditionally bought and sold software and used it. Erm, so, I-I think that-that-that thinking about that commercial aspect is an interesting aspect too. It's not just the technical, erm, but it is also difficult to system test something that's ma-that's an agent-type environment, so—

[00:31:41]

*People are desperately looking for what will replace the iPhone, erm, as the great platform, erm, its, erm, its sales are peaking, if not beginning to drop, certainly in the United States and Western Europe, the sales are beginning to drop. Have you got an idea of what that new thing may be; not at all?*

[00:31:59]

No, not me, no.

[00:32:00]

*Do you think IBM has?*

[00:32:02]

Erm, no, I think that's unlikely. But then, you know, I didn't know everything.

[00:32:07]

*[Laughs], well, near to everything, near to everything.*

[00:32:10]

Yeah, yeah, I mean, if it's, you know, if they really did, I would probably be one of the last to know, er, so—

[00:32:17]

*Erm, now, you're away from IBM, tell me about the IBM Watson Assistant?*

[00:32:21]

Sorry, the--?

[00:32:22]

*The AI, IBM Watson?*

[00:32:27]

Er, I can't really, 'cause I didn't-I didn't really work on it, so—

[00:32:32]

*You didn't work on it?*

[00:32:34]

Mm-hmm.

[00:32:35]

*Okay. Now, the, erm, in 2020, apparently, the first registered product designer from the Institute of Engineering Designers, erm, got their certificate. What was the idea of be-becoming-becoming a registered product designer?*

[00:32:54]

Er, to get, er... Well, basically, it would give you chartered status as-as an engineer, so, erm, that becomes part of your professional, er, recognition. Erm, for many product designers, because they have a lot of skill beyond a core engineering discipline, they find it hard to become CEng. So, this was-this was the purpose to recognise this type of engineering to allow consumers or employers to be able to distinguish between people who say they can do it, and people who have a proven track record, as with all of these chartered status type things. So, that's-that's really what-what it was about, it was about saying this is a profession, this is important to our industry and, erm, and so, these are the people who meet certain criteria.

[00:33:48]

*Er, and it was a d-d-a Dyson product engineer, was it not?*

[00:33:52]

Er, I'm not sure, I'm not sure who it was.

[00:33:55]

*Okay. Now, you've, er, used a keyword here, which I-I want you to examine professionally.*

[00:34:00]

Mm-hmm, mm-hmm.

[00:34:01]

*Architects are professionals because they can be kicked out, doctors are professionals because they c-can be kicked out, solicitors are professionals because they can be kicked out. Product designers are professional because they're paid.*

[00:34:12]

Mm-hmm, mm-hmm. As it were, I think you've got, erm, you've got, er, I mean the same with all IT, er, anybody can claim that they're a programmer, erm, you have to meet certain standards to be chartered. Erm, er, but I mean, you know, when you say accountants and lawyers, anybody can defend themselves but, erm, you do need to be,

er, you know, a professional to, er, erm, you know, well, people w-would be wise to- to employ a professional. So, we don't have mandatory professional status in our industry, that does mean that there is no value in being able to-to distinguish people who have, erm, you know, who have certain skills and have proved-proven that they meet a certain level. So, and that means then employers and, erm, you know people who are engaging a particular, er, engineering firm, can make that choice as to whether that chartered status is meaningful to them or not.

[00:35:09]

*There will be some members of the British Computer Society that may well have contributed to-to this horrendous, erm, system rolled out by the Post Office, called Horizon. And I erm, interviewed the current president of the BCS and I put it to him that if members of, erm, the BCS, are found to be somehow guilty and involved in that horrendous process what would the BCS do? And he said, "That's an interesting question, what do you think should happen to people who have been involved in the implementation, erm, of such a system, given that it was known that it was faulty?" It's a big ethical question, is it not?*

[00:36:05]

It is a big-it is a big ethical question because there is very-there are very few projects where the engineers actually have the "Go/No-go" erm, decision. It's, er, often other people, erm, and erm, but you know, there-there is-there, everybody has, er, certain levels of responsibility, erm, so, you know, it's to say, what should happen? It-it's, er, difficult to know about, erm, you know, if somebody, erm, should have shouted rather than, er, than spoke up in a meeting. What you're saying is, you know, it-it's a, er, I don't even know how to start, erm, answering that-that question when there, you know, without having full understanding of how the project worked. Who was-who was responsible for how the information was flowing, erm, how it was organised. Erm, you know, I've been on projects where the engineers are in charge, I've been on projects where the engineers, erm, are, you know, basically, are told to go away and do the engineering and-and leave the business to the business people. So, I know I've seen all sorts of levels, so, without knowing exactly how that project ran, it would be difficult to say, erm, you know this person, er, you know, this-this should happen to this type of person.

[00:37:19]

*Which do you prefer, which type of project do you prefer?*

[00:37:22]

Erm, [laughs] this is going to sound very strange but, ones where there is actually mutual respect between the professions. Erm, you-some projects are extremely technical and-and you probably do need the engineers in charge, but it is a massive relief if you're working with a first-class project manager, somebody with, erm, business and user experience, people with finance experience, it means you can forget about it. So, to me, the projects that have problems are when one profession thinks that they can do it all [laughs]. And the project that I've seen are most successful is when you have that collaboration and mutual respect between those professions, so, erm, yeah.

[00:38:28]

*Why should anybody join the IED? Talk to young people now who are designers—*

[00:38:34]

Yeah—

[00:38:35]

*Tell them, this is your pitch.*

[00:38:37]

[Laughs] why should they join? I think... So, it's a-erm, it's so, it would-it broadens your horizons and that accelerates your learning and, erm, and of course, the opportunities that come to you as you move through your profession. So, whatever job you do, you're learning and very early on in your-your career that-that might seem all you can cope with. But after two or three years, you start to get a little bored and maybe a-a-a little narrow and so, by joining any of the engineering institutions that-that-that, you know that matches what-the work you do, you will start to broaden your horizons, you'll see what new opportunities are available. You may be able to bring what you learn back to your job and become more successful there. So, it's really

how do you, erm, accelerate your career, so, broader opportunities, learn, erm, learn about new things, keep up to date, erm, and, er, increase the, er, success of your career.

[00:39:34]

*I, of course, re-read your interview that you gave, erm, to the Archives, erm, a year ago, wasn't it? Certainly, it was on Zoom.*

[00:39:41]

Er, last summer, yeah.

[00:39:41]

*And I think there was-I think there was a different background as well.*

[00:39:43]

[laughs]

[00:39:44]

*There was the same background here in my, erm, in terribly chaotic, erm, office. Erm, and I was very, very struck by one, erm, element o-o-of your consistent life as an engineer, and this is, you consistently retrain yourself, don't you?*

[00:40:09]

Mm-hmm, yes, yes.

[00:40:11]

*Tell me more about that.*

[00:40:14]

[Laughs] well, partly, it's because I like working on innovative projects and the next big thing. Erm, and so, you have to do two things, one, you have to train-constantly train your successor so that you can move on, and you have to learn new things, and one of the great things about working in a brand-new area, er, particularly one that-where everybody is innovating, is you're all learning together. So, erm, yes, I-I-I-it

would worry me if, in any month I couldn't say, this is what I've learned this month. I-don't-I don't, I-I-I would just-would be concerned if I hadn't learned anything. Erm, I-to me, it's-it's-it's a continuous process and, erm, there is new-there is always something else to learn.

[00:41:08]

*We're not at the end of April yet, but what have you learned in April?*

[00:41:12]

What have I learned in April? Erm, so, right down at the technical level, I've done an awful lot of [s/l pausing 00:41:17] different types of [unclear 00:41:16] structures. Erm, and erm, I'm just trying to think about it because... So, er, on the Egeria Project, I do a lot of-of coding and so, I'm always looking at-at new areas. Erm, we've been doing some strategic work around how you manage something called a Data Fabric, erm, and think about how information flows through an organisation. So-so, we've been doing some-some strategic learning around there, erm, and, erm, working on some white papers on-on how that-that would operate. Er, so-so, there's two levels where, erm, very deep technical, er, pieces around, er, er, pausing and integrating different types of model technology, and, er, and strategic thinking for an organisation.

[00:42:00]

*You seem to be able to work on multiple levels.*

[00:42:02]

Mm-hmm.

[00:42:02]

*How do you manage that, where does it come from?*

[00:42:07]

Well, that's a key engineering skill, is abstraction and to be able to chunk, to see patterns, erm, and to manage complexity, and er, that's a lot of what-what I do, that's-what-what is my core skill? It is actually that, is the management of complexity and

taking it into forms that-that, erm, that people can work with. And that means I can move to different areas and-and-and handle, erm, yeah, handle uncertainty and other types of things. So, yeah, that's-that's my meta-skill, if you like [laughs].

[00:42:59]

*Yes, but it's also a very detailed skill. What do you do to relax?*

[00:43:09]

Oh, hiking.

[00:43:12]

*Hiking?*

[00:43:14]

I love hiking, yes.

[00:43:13]

*You've been hiking, haven't you, I can see.*

[00:43:15]

Yes, oh, yes, every day.

[00:43:16]

*You've got the sun on your face.*

[00:43:17]

Every day, I try to-to walk every day, erm, and also do long-distance hikes. So, last year for the first-the first long-distance hike I did was South Downs Way. In a couple of weeks' time, I'm off to do the Cotswolds Way, and it is an amazing thing where you are on a journey, and every day, you're up, you get up and you walk and you see, and you know, and the landscape is part of the thing around you. So, er, I also like photography, so, that combination of being outside, being self-sufficient, navigating, taking photographs, that's... I just love it. And there is so much to see in-in-in, er, in Britain, so much.



[00:43:54]

*I-I've just finished a book for our reading group called "Two Degrees West" Nicholas Cage, was it, Nicholas, he walked down that two degrees west path, from Berwick down to Poole.*

[00:44:04]

Okay.

[00:44:04]

*I don't know whether you've read that but I can-I can see you doing that, definitely. You are in-in-incredibly successful in the honours that you've and you deserve them as well, and, of course, you-you have the CBE and so on. Do you think that you might have given some things up for your career?*

[00:44:22]

Hmm.

[00:44:21]

*Successful women often say they have, have you?*

[00:44:25]

Mm-hmm, well, you-you-you are always making choices, and erm, around where-how you spend your time and particularly in today's world, there are so many things to do, and erm, so, there's nothing I regret, that I chose not to do. I don't have a family, I chose that, erm, and, er, I don't have any regrets in that respect. So, I think, it is-it is that focus I probably have a smaller, but I have a-a good set of friends but they're all in the same profession, so, erm, yeah, may-maybe that-that would be another area, I would have a broader set of, er, of friends, maybe, a broader set of hobbies. Erm, but I still have a lot-a-a lot, a large future, so, er, these things, you know, there's time-there's time to do those things as well.

[00:45:35]

*Well, maybe now are “retired” you—you may well be able to. What’s your advice for you women entering the industry now?*

[00:45:47]

Erm, the—It’s very easy for... You can never know it all and it’s very easy to feel that you’re no good at it, but actually, erm, you need to be very realistic that, everybody is in that situation. And so, the important thing is to be focused on being as good as you can and delivering quality and then remembering that that’s what you’ve done. So, try to keep track of everything you do and congratulate yourself on how you’re progressing, what you’re learning, what you’re achieving because you cannot expect anybody else to do it. You know you go through school and teachers say, “Oh, that’s a really good thing” but when you get into the working world, no one is telling you how well you’re doing and if you’re waiting for that, you can feel, erm, you—you feel like you’re a failure. So, you have to go in being your own cheerleader, erm, and keep asking why, erm, keep learning, erm, do the best, deliver what you can in the best, er, be-be-be as good as you can and then, as I say, continuously tell yourself you’re doing a great job.

[00:47:11]

*Do you keep a diary?*

[00:47:14]

Er, not-not a sort of traditional diary, I have notes every day of-of what I’ve done and what I need to do and that type of thing, yeah.

[00:47:24]

*But not-not, I assume--*

[00:47:28]

No, no, not a dear diary type thing, no.

[00:47:30]

*Okay. You said in your previous interview that-that it really wasn't possible or wasn't very effective when women in management roles shouted and screamed; men can do that but women can't. They erm, get accused of being—And you wouldn't use the word, but I imagine you were going to say hysterical.*

[00:47:52]

Mm-hmm, yes.

[00:47:54]

*How do you overcome that?*

[00:47:55]

[Laughs] by being calm, but I-I-I mean the reality is that as you lose your temper, you lose your thinking brain, so, being calm is actually an effective way of-of-of behaving. And I think that style of leadership is-is being increasingly recognised. Certainly, in the open-source community, I can't tell anyone to do anything, erm, nobody works for me, and yet we work together and we have a mission and we're moving forward, everything is as you would expect, so—

[00:48:30]

*I think it was the prime minister of-of Estonia, wasn't it, erm, is a woman? She said, well, if women were in charge we wouldn't have had this war in-in, erm, Ukraine, er, are you of that opinion?*

[00:48:40]

No [laughs], I just, I-I-I-I think this, er, women can do this, men can't, I just don't believe it. I think we all have a mix of skills and, er, yeah, I just don't subscribe to, you know the, er, erm, that deep gender difference, I just know, erm, women who won't compromise or won't listen and erm, force their own way and I know men who are, er, amazing, erm, collaborators and things like that. I just-I just, yeah, I just don't like that type of talk [laughs].

[00:49:22]

*You wouldn't classify yourself as a feminist?*

[00:49:27]

[Sighs], that's such an over-overused word. I certainly believe that women should have an equal place in society as men, I don't think women are inferior to men. Erm, I think we are equal, if that makes me a feminist, absolutely and I am.

[00:49:48]

*I-I-I'm not going to ask you what a woman is because that is-is such a contentious question now, I'm not going to ask you—*

[00:49:57]

Yeah, yeah, and-and-and that's also something we need to let go of, is actually, that-that-that question is binary. It-it's increasingly being shown as nonsense and, er, so, to me, yes, it's a bit like trying to judge somebody from their age, we shouldn't be judging people from their gender either. Erm, and this current, erm, er, you know, the-the support for transgender people, I-I'm fully behind and I think, you know, certainly having been in an industry where my gender was not welcome, erm, for many years, er, where I was encouraged to dress like a man so I didn't look so different. Erm, I have a small understanding of what someone who is transgender is going through and I just wish we let go of our fixation with age, gender, etc. in areas where it just doesn't matter, erm, particularly, as I say, in the professional space.

[00:50:51]

*Of the technologies outside your immediate remit and you're current work, what are the what technologies, as you look sideways do you think, ooh, that looks interesting, that could be something for the future?*

[00:51:00]

[Laughs]. So, erm, one-one of the things we've been playing with is, erm, the idea of using, er, 3D printing to create, erm, architectural design kits, to help people to build up models of, er, distributed architecture. And this idea of 3D printing I find-I find absolutely fascinating. Erm, and I think it has so much potential to get key parts to key places, a-around the world. Er, so, I think that-that-that's fun, erm, that's a—

[00:51:31]

*How-how-how does it actually work?*

[00:51:34]

How does 3D printing work? Do you know, I'm not entirely sure, it looks magic to me at the moment. So, basically, you start with a-a mathematical model of the shape that you want and that is what drives the printer and the printer has, erm, you know, has material in it, a-a-and it shapes that material. So, that's my [unclear 00:51:56]

[00:51:56]

*What-what material does it have?*

[00:51:58]

Sorry?

[00:51:59]

*Does it have-does it plastic or something?*

[00:52:02]

It works with plastic, yes, mostly, yes.

[00:52:04]

*Ahh.*

[00:52:06]

So, erm, so, yes, it-it-it's not something I know very much about, I've got a very hazy idea of how it works, but it's something that's erm, is fascinating and if-if we can use this as a way of, er, helping people learn about architecture, and particularly doing distributed architecture, erm, this is going to be, er, you know, it-it's going to be not only a fun project but, er, a valuable one.

[00:52:29]

*So, you could build a physical model, is that what you're thinking and-and demonstrate it to people?*

[00:52:33]

Yeah, so, the idea is, so-so, Egeria itself is very distributed, it's for connecting tools on different cloud platforms and also things together. So, there are different types of servers that perform different types of roles in the architecture, so, all have different shapes for each type of server, and then you can plug-in connectors to different technologies into it and they're different types of connectors so, they'll have different holes in the base, so, how you can connect it up. Then, we'll be able to link things together. So, we're thinking of a-a sort of castle-type, erm, er, sort of scenario where, you-you know, you're putting your castles in the different places and you're connecting them up, er, so, that's it. So, it-it's designed to be fun but also to teach how you assemble these different things, er, together, so—

[00:53:31]

*As my son would say, "Cool."*

[00:53:34]

I think it will be, er, you know, but that's-that's... Everyone we talk to has thought it-thought it would be fun, so, mm-hmm.

[00:53:39]

*A lot of people are putting a lot of, erm, interest into an investment, into blockchain, your view on this technology?*

[00:53:49]

Erm, I think it would be better if there was more design around the data that sits with the blockchain. So, there is a lot of focus on the transactional nature of it, erm, but it is referring to data and how that data is managed, how-what the standards are for particular types of, erm, er, exchanges that are happening between people. All of that needs more work.

[00:54:18]

*Do you have, erm, bitcoin or any other cyber currency?*

[00:54:24]

No, no.

[00:54:25]

*Why not?*

[00:54:26]

There's no need for it.

[00:54:30]

*Some people say it releases us from the bonds of government, erm, regulation and it is really rather like the-the internet as a process.*

[00:54:42]

Mm-hmm.

[00:54:43]

*You-you're not—*

[00:54:44]

People are still burning an awful of processing power, erm, so, no, I just have no, there's nothing I need to-I need bitcoins to buy, I don't need to buy anything so, no.

[00:55:01]

*Do you read French?*

[00:55:03]

Do I read French?

[00:55:05]

*Yes.*

[00:55:05]

Badly.

[00:55:07]

*Oh, well, then you probably can't read my friend's book, erm, Daniel Ichbiah has written a book on-on bitcoins and it's selling over 200 copies a week, in-in France, it's in French, [laughs] and doing rather well for him.*

[00:55:18]

Uh-huh.

[00:55:18]

*And, er, I just got a-a-a big earful about bitcoins and cryptocurrencies, erm, over the weekend.*

[00:55:22]

Mm-hmm, yeah.

[00:55:24]

*What would you say your next big step is after this—Final question?*

[00:55:29]

After, so, the big thing impact--

[00:55:31]

*When you-you really establish this technology and you've taken it into a Horizon 2 and Horizon 3—*

[00:55:37]

[Laughs] well, that's a big, big step, that was what I was going to say.

[00:55:40]

*Okay, [laughs].*

[00:55:41]



That-that-that's-that's a pretty big step, erm, and we-it should enable a whole new raft of innovation. It's one of those, whenever we-you establish an important standard, erm, in the industry, then, suddenly, there is a new raft of innovation because what's stopped you before disappears. And so, if Egeria is successful, then the vis-the-the, you know, the visibility, the transparency of [unclear 00:56:06] operations, will, er, be greatly enhanced. Erm, and, er, different professions will work together much better using-through-through the tooling. Erm, and if we're successful, that actually should push down into the platforms, not be a separate thing that we've had to put on the side. Erm, and so, as that innovation opens up, I'm sure that's where we'll be looking.

[00:56:29]

*Always looking to the future.*

[00:56:31]

Yes.

[00:56:31]

*And hopefully, inspiring the future as well. You've captured the past and you're inspiring the future, yet again, Mandy Chessell, CBE, thank you very much for your second contribution to the archives.*

*End of Interview*