Capturing the Past, Inspiring the Future

Chris Winter

Interviewed by

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Welcome to the Archives of Information Technology. It's January 9th 2020 and we're in Tiverton in Devon. I'm Tom Abram, the editor of Archives of IT, and today I'll be talking to Chris Winter who's invited me to his home. Chris is an independent consultant specialising in applying engineering methods to major complex IT projects. Prior to 2009 he worked for IBM for 31 years and reached the pinnacle of the technical career path as an IBM Fellow, noted especially for his development of IBM's performance engineering disciplines. Chris, thank you for inviting me to your home. We'll talk a lot about the detail of your background career and experiences in a moment, but first of all, can you set the scene by telling us about the Chris Winter headline, performance engineering and why is it important?

Well, Tom, welcome to Tiverton. Performance engineering to me has been something throughout my career and I first, my first encounter with it was as early as 1970, having started in the IT industry in 1969. And the challenge we had was how do you fit a complete CAD circuit design system into 8k of memory. The shorter answer is, you can't, and we had to buy another 4k of memory, costing thousands of pounds. So I think that was the first time I encountered it and it's kind of never gone away and it's been a challenge, an interest and contributed to my career. Hopefully I've contributed a lot on the topic to others. So, throughout the seventies I worked for a software house, based in London, and more and more got involved with performance with a variety of clients. Probably the two most best known clients I had in the seventies, one was the Bank of England where I was the chief programmer, and then responsible for programming techniques. They'd recently moved from ICL to IBM. Few people know the Bank of England have a retail bank which, offering, mainly it's for their own staff, for public industry, for the royal family, they have their accounts there, etc. But they were one of the first banks, to my knowledge, certainly the UK, to have an online retail banking capability, which went live in 1975. Yes, '75. The other customer that was perhaps infamous, but not very, when I was working there in 1975, was the Iraqi Atomic Energy Commission. I didn't do much performance engineering there, things were far more basic. And probably the most challenging year of my life, professional life, and life. It was hard. Not a place I'd choose to go back to, especially now! But, relationships with Iraq and the UK were significantly better in 1975. The contract I was on was actually facilitated by the British Council, which is an organisation that still exists, and very focussed around education. And

my role was to set up their mainframe and get it working, get it- improve the way it was working, and not from a performance point of view, but simply from how do you use it, set it up as a bureau for other government departments, etc. Unfortunately the Americans and the Israelis truly bombed the project out, in 1981, long after I'd left. In the eighties I probably had one of my most significant performance challenges for IBM and its manufacturing systems, and it started, 1982 I joined as Chief Programmer. I became the Chief Architect because the term architect was just coming in then and I kind of morphed into that. I was still doing the same job but they just gave me a different title. And that was to do the materials requirements planning for all of Europe in a single system so that all the parts- to remove the latency between the different planning cycles and get a better handle on supply of parts and reduction in inventory. That went live in 1985. My challenge was twofold. One, I had to make the system perform and it was about two orders of magnitude improvement, which was quite significant. And the second thing was, there wasn't an approach for performance engineering, so in parallel I developed the approach. The system went live, very successfully. It was adopted by the Americans and the Japanese. In 1989 it went live across the world as a global system and went up to another order of magnitude in terms of performance. Somewhere along those lines, somewhere in that time, what I did was I actually presented a paper at Global Computer Measurements Group on designing applications from a performance perspective and I was surprised at how much interest I got, because before then most people, they only thought about the performance of the machine, how fast was whatever the processor was. In those days mainframes were not chips, they were bipolar. The performance of storage, the performance of, you know, the components of the machine and not necessarily the applications.

[0:07:40]

So from what you're saying and what I've read in the background papers, it seems to me that in a nutshell – and correct me if I've got the wrong end of the stick – the concept of performance engineering kind of makes a distinction between whether the computer hardware and software is doing the sums correctly and producing the right answers and so on, and translating that into whether the business process actually works and supports the user in terms of their business objectives. Is that fair?

Yeah, I think it's subtly different and it's, at that point, I think, my realisation was, performance engineering was considered in the hardware and the software, the operating system, by the computer providers but it wasn't really given enough focus in the, by the people building the applications on top of the computers. So, performance engineering applies everywhere, but when you're building applications, which is my, what I do as a, you know, throughout my career, it's everything, it's all of those things, not necessarily a broader topic and a less popular one. And even today – and we'll come to that later – it still receives, in my own opinion, too little in terms of focus and recognition and often not enough investment until it all goes wrong.

Right.

I'll come to that.

So you think that is a key issue in making so-called IT projects successful in terms of their outcome.

Yeah. So, in the nineties what I did was I created, if you like, formal methods for adoption by IBM as globally, okay? Still in place today, right? So that was a part of my legacy. Also a community of a couple of thousand performance engineers trained in the methods, and had that interest, okay? So that's where that went. Now, if we then look at the importance of performance engineering from a consumer point of view, consumers being the general public, okay? An example I often quote, and I think this is a UK-specific and something where the UK can hold its head up with pride, and that's the system that went live in the financial services sector in the, I think it was about 2008, which was faster payments.

Oh yes, well known to all of us from our online banking.

Well known to us and, I'm going to say we all benefit from it. And I'm not entirely sure of the genesis, but the urban myth of that is that at a meeting of a group of bankers they were talking about faster payments but they hadn't actually at that time determined the target. Out of that meeting one bank, who was particularly bullish at

the time, but I'll keep anonymous, but they were the star of using IT in the noughties, said well, ten seconds seems to be a reasonable response time if you're sitting at a, you know, there with your home computer on a browser and you make a payment, ten seconds is a reasonable time to wait for a response. And when you think that that ten seconds includes going from your browser through whatever payment site's connecting, through to the banks both involved and getting that cleared, it was a hell of a challenge. And I don't know another country in the world that has that. When I mention this when I've got foreign customers, they just, they say well, when's this going to happen? You say, well over a decade ago, they are blown away. Now what it is is an example of the benefits of performance engineering of having that requirement set and regulated, right? Different example, different industry. Let's take Amazon, right? I guess quite a few people listening to this, when was the first time you had the courage to buy a book on Amazon in the nineties, right?

Are you asking me that question?

It's a rhetorical question, right? But there was a kind of nervousness about when e-commerce came in, of actually putting in your credit card details and everything else. Now, beginning of the interview, I live near Tiverton in Devon, in a fairly rural setting, I'm an Amazon Prime customer and I rely on Amazon Prime because the nearest shopping centres for me are 30 miles away. It's not the sort of thing you can just hop in the car and go and buy something. Invariably when I do, they're out of stock, even to the point where you say, oh that's a pity, I came here specially, specifically to buy this item, they said oh, have you tried our online site? Which is… But Amazon, when you look at it, the performance of it, from placing the order, to the fulfilment of the order, and the delivery on the logistic chain in a day is quite staggering to me, and it's all enabled by IT, all of it.

I think that's a brilliant illustration then of the power of this performance management and its importance to us.

[0:14:13]
And having that vision, you know, it's a differentiator, to be able to order something. I have to admit I do kind of feel guilty sometimes about using Amazon, because I'd

rather use local, okay? Certainly when it comes to food I buy nearly all my food in the local village and I can buy meat from the butcher, who's the farmer whose sheep I'm eating, yeah, for example. So I do have this kind of moral dilemma.

Don't we all. So it's an issue of the day, isn't it?

It is. But from a purely performance engineering, but not a moralistic one, I think Amazon do a great job of end-to-end fulfilment.

[0:14:59]
I think that gives us a flavour of what performance engineering's all about. Let's go back to how you got into this business from, you know, day one in your life. So…

Day one in my working life?

No, in your life on this planet.

Oh, good gracious.

So you were born in 1952.

I was.

We're almost the same age and I notice that our mothers were both born in the same year as well, so I'll be interested to hear what parallels there are in our lives and careers. Tell us about your start in life and where did you live and what were your parents like?

Okay, I mean I was born in Haslemere, Surrey, which is a commuter town, predominantly. And I was – I'm just trying to think – probably second, third generation, born into a, the family business was grocery. My first part-time job was doing grocery deliveries on a Saturday morning.

And that was a family business in the sense that, what, your parents owned the shop and they had it passed on from their grandparents or what…?

When I was born, the business was owned by my grandmother and it was her first husband that started the business in the 19th century. Talking, just a little segue back to Amazon and how nice it is to have things delivered, one of the things my family did from early days in the 19th century was to deliver things in a pony and trap, deliver groceries. I still remember when they went, they bought a van long before I was born, that didn't get replaced till 1961, which was a 1936 Austin 7 van which they did the deliveries in. So we've kind of come full circle now, that people now have groceries delivered, ordered online, enabled by IT and delivered. So we're kind of, bit of a back to the future, isn't it, moment for groceries. Slight segue. So that was that. My mother was a teacher. I had a really good primary education.

Your mother was a teacher of what?

English and French.

Right. So no IT connection there then, not technology or whatever.

None at all, none at all.

[0:18:07]
And you delivered the groceries on a bike did you, when you were…

No, my brother drove the car and we did it together on a Saturday morning. That was our, that was our job until my father sold the business in the early seventies. Interestingly enough, there was no IT, also my dad was adamant that we didn't follow him into the family business, right?

Right. So his ambition was for you to do, did he have a vision of what you should do?

No, no. What he had a vision of, which I think was brilliant, you know, so in the early mid-sixties was when the supermarket started. Stack 'em high, sell 'em cheap,

yeah? As a small family grocer, you know, being marginalised by the supermarket down the road, yeah? So my dad specialised and turned the business into a delicatessen. Now, supermarkets didn't have delicatessen counters there. He specialised in cold meats and cheeses, which was just living next to the shop, and I still love cheese. [laughs] There was a whole selection of cheeses just available, right?

So he was a smart businessman then, if he recognised, as many businesses failed to, the need to change and adapt to the market.

Which he did. But I think he was also smart, I think he was also correct that it was only going to get more challenging and it wasn't a future, it wasn't a good place to be. So I'm one of three brothers, the youngest. My eldest brother was an entomologist all his professional life, a world expert on insects, working for the Forestry Commission Research Centre near Farnham. My middle, my other brother was an accountant, became company secretary for a number of small companies and then went into private practice. He's practising slightly less, well he's practising far less these days, but still practising. I have to admit, accountancy did not inspire me as a teenager.

So all three brothers ended up as professionals then.

Yeah.

And your father's ambition was, I think if I understand, principally he knew grocery wasn't a smart way to go.

Correct.

[0:21:09]
But did he believe in the power of education as a way out of that?

I think both my parents did. Myself, nor my brothers, none of us went to university.

Oh right.

For different reasons. Myself and my elder brother certainly was out of choice. We both went to the same grammar school. I became quite disenchanted with school life.

Why was that?

I just didn't like what I perceived to be a lack of respect for me as a person.

How would that be evidenced by relationships with teachers or whatever?

I just felt, I don't know, I just didn't particularly like, I just always felt I was being talked down to. I was reasonably successful academically, more successful from a sporting perspective. I still play sport, I'm still an active squash player. My knees are holding out, thankfully. I don't know, it just wasn't for me. I just didn't enjoy school life towards the end of it. I tried to leave, I was offered my first job at 16. I kind of in the discussions with the career officer, the school was completely hopeless, absolutely hopeless on careers, because the only thing they could see is you finish school, you go to university, do teacher training, come back and teach. And beyond that they had no experience. Local career officer was better, and we kind of boiled it down to two things. I had an interest in engines at the time, and that was something I could relate to, and the computer industry to me seemed to have a future, which the grocery business didn't have. And I, one of the things I realised was, that my interest in engines was – motorcycles in particular – was primarily driven by the fact I couldn't afford to get somebody else to fix them, so I had to do it. And I thought, I don't really want to be in engines for the rest of my… and I knew nothing about computers. Probably the best decision I made from a career perspective was when I was 16 and said I want to be in the computer industry because it has a future. With hindsight I completely underestimated the scope of its future.

[0:24:09]
So what did you know about computers in…

Nothing.

What, 1969 you left school.

Nothing.

What inspired that ambition then, to get involved with them?

Primarily, if you come back to, you know, my dad saying there's not a future in groceries, there seemed to be a future in computers.

Right.

That was it.

So what were you good at at school? I mean apart from sport. I mean, did you have an interest in science or mathematics or whatever?

Yeah, I did. Yeah, I guess science and maths, mainly. I was never particularly interested in languages, although I left with O levels in all of those. I left with two maths O levels and three science O levels. I got halfway through doing A levels in two maths and physics and I think that just compounded my view that I just didn't… There were, for example, I remember things in physics where I was challenging my physics master about some of the laws of physics and saying, well that doesn't stack up because I can think of exceptions, and just being told to shut up and believe me.

Yeah. So your teachers don't, it sounds like your teachers weren't inspiring in any way then?

No.

In fact, it sounds like they were a negative influence on your interest in learning.

Yeah, that's fair. That's fair. Right up to the headmaster. None of them were inspiring me.

And do you think that was a particular issue for you, or was it the nature of the school, or what? I mean, you know, I went to a school like you're talking about and it was a very different attitude in those days in terms of the relationship between teacher and student, you know. You were the student, you were told what to do by… yeah.

Master-slave, wasn't it?

Yeah, exactly.

Do as I say.

And you didn't respond well to that?

No, increasingly I got disenchanted. And so at the age of 15, 16, I knew what I wanted to do, I got there at 17, got my first job in the industry.

[0:26:46]
Can I just labour this point a bit, because I'm very interested to know, to understand what people did know about computers then. Because, you know, as I said, I'm about the same age as you are and I ended up going to university to study engineering and understood that part of that was going to be about computers and electronics and so on. But I don't remember computers being, you know, kind of a big topic for discussion at that time or having a very high profile in terms of public awareness, so…

In all honestly, I have no idea where it came from.

Right, okay.

I was, I honestly don't remember. I don't remember when it came into the discussion or to the agenda, it just seemed like something with a future, a good place to be. And I mean let's face it, it probably was irrational, it was extremely fortunate. It's not a decision I have ever, will ever, ever regret. How can a 16 year old make such a lucky

decision, which turned out to be a good decision, I mean it has to be an enormous amount of luck. Because…

[0:28:16]
So how did you execute the decision then? You got a job somehow.

I got a job somehow. I got an offer of a job that my parents wouldn't let me take, somehow. I started and it was like day one, just, it wasn't, I mean before I really got into doing anything with computers, the work environment, I just, it was just somebody flicked a switch. It was being miserable at school and I loved being at work, still do. And that's not, I think that's separate to what it is you're working on. I think it's a whole human interaction thing, the social side of it, the social side of work, I really enjoyed it. My first company, I think I was number 29 employee, in an old country house on the outskirts of Aldershot. The further you can get away from Aldershot, the better. [laughs] It's not exactly… it's a massive army town, it's a miserable place. But I loved work from day one, I really, really enjoyed it. Got into some really interesting stuff, so apart from what I mentioned on performance engineering, in 19… I don't know. So I was a trainee programmer, in 1970 we were, this little company that was, its money came, it was a bureau for doing computer-aided design in manufacturing. Very, very early bureaus to, mainly circuit design and circuit boards, an early what was then referred to as integrated circuits. And we did a lot of work to produce the masters through photolithography. The company still exists. Award winning, moved to Glenrothes in Scotland, I think it's now got American owners, and still a kind of world leader in that area.

This was Altergo?

No, this was Computer Graphics. Compugraphics. Compugraphics International. I'm not quite sure, I think it was, Scotland was the international bit. But in 1970, somehow we got involved, I think it was a merchant bank conceived this idea of a computer game, an economics game and when you say it now, I mean it's just unbelievable what we did in 1970. So the main system was running on a PDP something, somewhere in Switzerland. The first time we went public on it was at an exhibition at – I'm just trying to think – Earl's Court or Olympia, one of the two. We

were the theme stand, basically this amazing kind of biodome, long before people in Cornwall with, what's it called?

I know what you mean.

And we were there and each, so three, there were three teams competing and they just came through and they'd be in there half an hour or something and they'd play. They'd be using video terminals. That was a bit avant-garde in 1970. The terminals were connected to a timesharing mainframe, probably less powerful than an iPhone, in Switzerland, yeah? The results of that were fed back, we were running a sort of central service with our big graphics display, we were teaching people how to use the system. We got the results, the results were then plotted and displayed on our big graphics terminal and our mini-computer with 8k of memory then was interfacing with nine 35mm slide projectors. So depending on how they were doing in their economics game, and three teams were grouped as countries, then the slides we'd project above the team to say if the country was prospering or not. So we had online slide projections, didn't have the capability to project graphics in 1970, and it went on to be shown in other exhibitions around Europe. But that was quite, when I look back at that, that was quite stunning for 1970.

And this was driven by a PDP something or other, did you say?

The mainframe was PDP. Our graphics to play was an American company called IDIIOM, and the IDIIOM processor was a Varian 620/i, an early 3G, third generation machine, yeah, that used chips, integrated circuits, right, which processed, 16bit machine. And I look back on it, I just, wow, that was quite bleeding edge.

[0:34:25]
How did you get from the position of leaving school with O levels and no experience of computing to doing this clever stuff with computers? Did you get some training or something?

All of it on the job.

Right.

Probably the most formal training was three months of half-day release at the local college when I was in Aldershot. Various training. I was just trying to think. I moved into local government. So the company in Aldershot, I loved it. We were really, really bleeding edge stuff, but I didn't know it. I just, I didn't have a reference point. Unfortunately, the bank decided that they couldn't afford the R&D side I was on, so they told them they had to close it down, sold it off. The bureau's still going, in Scotland. Funnily enough, at the age of 18, one of their customers for the system was in, was Phillips Petroleum, based in Monaco. So I was – I've only been out of work once, and that was at the age of 18 at Christmas, for six weeks, wholly miserable. The help I had from whatever the DWP was called was derisible at the time. I was treated like it was all my fault that I'd been made redundant. And then two things happened. One was I found myself another job, for West Sussex County Council, which we'll come back to, and I had a, initially a job offer of a fulltime job in Monaco at the age of 18, which seemed kind of attractive. And then my boss had declined the job and then accepted the job, so the job offer turned into three months' contract as opposed to permanent. And I'd just been out of work, miserable time for six weeks, and I got a job offer at West Sussex County Council, and maybe I was horribly over-serious and decided not to head off to the south of France. I'm kind of quite cool about that because I got into IBM technology, which was a much, much bigger marketplace, and my technical skills were far more portable. Again, I think it was absolutely the right decision, it possibly sounds a bit of a boring decision for an 18 year old to take.

Did your parents influence you in any of this?

No. No, I'll come… really, I think about the only time either of my parents took, helped me with a decision on my career was, as I said, in 1975, faced with heading off to Iraq for a while and my dad said, you know, he said, I thought about going to Australia, and I'm not unhappy with my life, not only this, but I always think, I wonder what would have happened, he said, you know, it's not forever if you do it. And that was about the only time my parents got involved with, you know, career decisions like that. Yeah?

[0:38:20]
What did they think about you not going to university?

Oh, they were a bit disappointed, they wanted me to go.

But they didn't make life difficult or anything?

No. No, I mean…

They respected your decision.

They respected, yeah, my mother's network cast around, helped me get my first job, okay? Not the one I, not the Institute of Oceanography, right? But that was it, it got me on the ladder. But they were disappointed, absolutely. I've never had any… it's like, both my kids are at university, have been through university, my daughter did most of her Masters and then, what she was doing was very vocational and then found out she couldn't actually do what she wanted to do. And she's now a project manager for Jaguar, currently on assignment in Munich. And my son is a project manager on the procurement side of MOD in Bristol. Just completed his Masters, which they sponsored and funded, last year, in project management and business studies. So my kids are far more academically – what's the word – achievers, they've achieved far more than me academically.

I'm not sure that's a great measure of anything though, is it, academic achievement? It's the outcome in terms [laughs], in terms of what you get done that's important.

Yeah. I mean you're not here because I have or haven't got a degree.

Yeah, exactly so.

[0:40:17]
Something, something else that was important to me is professional development, professional certification, etc. One of the things I started with IBM in the… early

mid-nineties, I think, IBM had a very good, that they established with their services business in the nineties, was a very good professional structure in the services world. And at that time I was also, I thought it would be, if you like, partly with the lack of academic qualifications, I thought I would seek some professional qualifications, initially with the British Computer Society. And I kind of thought there's a lot of similarities here, right? A lot of similarities, in terms of what they were looking for. Actually the IBM processes around it were more rigorous than the BCS. So I kind of kicked off this idea, in terms of initiating the idea, I had help from a couple of key people in the early days. One was Ian Nussey, who was a Fellow of both, he was a Vice-President of the IET and a Fellow of the Royal Academy of Engineering, and he helped make the contacts and get the whole thing, me in front of people and so on and so forth. I remember one of the very first meetings with the professional bodies, and I kind of put this vision- oh sorry, the second person was Geoff Robinson who was IBM Lab Director of Hursley. So this meeting we had with the institutions was on Geoff's last day as an IBM employee and the following week he took up his position as BCS President. After that he was CEO of Ordnance Survey, after he finished at the BCS and all that. So we kind of got there. And one of the things I put up in front of them, which shocked them, was a degree will help you get a job, but not a career. They said, what do you mean by that? I said, well, you know, I think a degree does help. And today, I think it's gone too far, with degrees. There's too many people taking too many useless degrees and ending up in debt. I find it a bit morally repugnant, to be honest.

Yeah, yeah, I understand what you mean.

Yeah. And - even though I'm a visiting professor now – and so over a number of years we got in place licences between IBM and BCS and what was the IEE, now the IET, which recognised that our career structures and basically said, you know, and aligned the two. And then the Americans came in and did the same thing with the Open Group, with their qualifications, largely based around the IBM things, but triggered from my ideas. And I ran, I basically ran that, the IBM side of that, actually beyond when I retired.

Right, so you've contributed to the professional structure of the industry.

Yes. So I mean my professional qualifications is chartered engineer and chartered IT professional, yeah? Which is separate to my membership, you know, being Fellows of both those institutions. But I do believe, you know, that that is really important. One thing in particular I liked about the BCS was they have a points system to professional membership. If you had a relevant degree then you got some points, the IET really got a bit quite sniffy if you didn't have a degree, you weren't a functioning person. And that still exists. The IET is too much academic, what's the word? You know, influence. And it took a long time before the IET accepted me and made me a Fellow, right? And they said, well, you've got to write a dissertation. I'm not going to write a dissertation. Oh well, you can submit your work, submit some of your work. So I submitted some work on performance engineering and the response to that was, well, we don't understand it. [laughs]

Whose problem was that?

They said, well, we want you to join. I said, you might want me to join, but I'll join on my terms. Finally I did and I got interviewed by three Fellows and we talked a lot about forked engineering and they were very impressed and then they said well, we'd like to know more about it, can you share it with us? I said, no, sorry, it's proprietary. [laughs] But, and I was, I was on the skills professional members' board of the BCS, I was on the skills board for IET. I was on, when trying to have CITP shared between the two, I was on the shadow board that we set up, ran for a couple of years under Charles Hughes' chairmanship. Because to me, you know, you need a, you don't really want things tied to a particular institution, you want an institution, you know, I said you differentiate the institution on the services you provide. But the professional qualifications need to be accepted across all of industry.

[0:46:48]
Well, you raise an interesting issue there, I think, because I'm familiar with Charles Hughes and CITP and all of those developments. As a bit of a digression, I mean it's interesting, isn't it, that in spite of the BCS's efforts to professionalise the industry, it's never really, the industry has never really achieved the same status for professionalism as lawyers and doctors and…

Or other engineering disciplines. Civil engineering.

Yes. There's no licence to practise, for example.

No.

Well, why do you think that is?

I think part of it, part of it – we're going back probably about 20 years now – I think part of it is where computing started, and I think, I think those qualifications are more recognised in what I call the computer industry, which is the people who make computers and systems software, than it is in the IT industry, that use their technologies and tend to exist within banking and retail and insurance and all the other places, and it's never… Part of it is, I think it's still, really it's still only what, 50 years old, say, part of it, and part of that sort of immaturity and somehow it's just never, never got traction. I value it, I think if you're buying professional services, for example, you should have some, something which says well, this person is at this level of professional competence.

Yes, yes.

Which is what the IBM professions were, when they were conceived almost 30 years ago, right? So kind of, I spent quite a lot of time on this. We had a programme running that I'm afraid I'm responsible for its name. It was readily adopted, but I just, I pinched the idea. And we called the programme, it was Professionalism in IT – ProfIT, was the acronym. It was conceived in a meeting in the BCS London office in Mansfield Street on 8th November 2003 somewhere between half past nine and 11 o'clock. Okay? I'll tell you why in a minute, I know that. And when I arrived for the meeting, they had – you remember the old pegboards with letters that you plugged in?

Yeah.

Well, it was limited on space and 'Professionalism and IT' didn't fit across the pegboard, so they'd limited it to 'Prof IT'. I thought, what a cracking name. I introduced it. Charles and the rest of the working group, he said, great, that's it, right? Why do I remember that day? There were two significant events on that day. One was in the industry; it was when the announcement of the NHS IT suppliers for the big NHS programme were announced that morning. IBM was not there, thank goodness. Although we bid, we didn't want it. We knew it would be a disaster. We should come back to that later.

This was NPfIT, the National Programme trying to…

Yes, the National Programme was all of that…

Richard Granger and co.

Which BT had the Spine and Accenture and CDC and all that, some of the other big players were awarded it, lots. Come back to that later. But the really memorable event is, I left Mansfield Street, I walked down to Oxford Street. Why did I walk down to Oxford Street? Because I saw a double decker, open double decker bus driving along Oxford Street, 11 o'clock in the morning, with Martin Johnson holding the Rugby World Cup aloft. So there's another quirk we haven't touched on, and I don't know why, I have this really, really weird brain around dates. I remember dates. I can't remember people's names, I can remember dates going back, really trivial things. I was also, I don't know, I also found myself quite adept in the early days of writing date routines for computers. I've got this strange brain that works on dates. I can't explain it, it's in the DNA somewhere, right? And I can do date calculations in my head, all sorts of weird things, right? But I remember things. So three big things happened on that day, and one was kicking off the whole Professionalism thing, right? Has it succeeded? No. It's there. I think globally it's more there, I was very keen, into the ProfIT initiative. I said if we don't go international we'll be irrelevant. But it didn't happen.

[0:52:36]

Ah, I would guess it's unlikely to happen now because, well, perhaps because of the structure of the industry. I mean you mentioned a while ago that the computing industry is different from the IT industry and I mean I struggle, to be honest, to define what the IT industry is, because it's said there are two and a half million people who work in IT and it constitutes between five and 10% of the GDP of the UK. But lots of those people are working in IT departments, everybody uses IT in the course of their business, whatever their business is. So IT is kind of ubiquitous, isn't it, and it's quite difficult – well, unless you've got a good definition – it's quite difficult to draw a boundary around what is the IT industry.

You raise so many points in my head, they're all firing off at the moment. Probably if we start with the definition. My own personal view, I've aired this quite often, I actually teach it at the university now, is the computer industry to me. The computer industry produces computers, computer peripherals, systems software up to middleware. And above that, applications typically are- there are packages, obviously, the big packages that are out there. I mean packages to me have become far more accepted and rightly so, because there's so many things, there aren't unique requirements for companies, particularly in the back office, right? If you think about the first packages that I became aware of, probably in the late sixties, early seventies, was things like payroll. I remember a company called Walker's introduced, the first one I was aware of was the first general ledger application, package. When you think about finance and so many things about, well accounting, there's a common set of regulatory requirements that have to be met. That is perfect. The packages, I mean if I have a client today and they say we're going to develop a system, my first answer is, why? What's different? Why would you do that? Yeah? So, my definition is the application. The IT industry is more about developing applications, installing packages for companies and running them. Okay? Running them. And I still think, I mean if you take cloud computing, to me that fits in the IT industry. They're using hardware and software, whatever they've done. You take Amazon, for example, back to Amazon, they've done some amazing stuff in the area of systems management, which is the software to help you run the stuff, and the service management, which is running across that to make sure that the systems are run, that they're monitored, when they fall over they're repaired. I can't find… very little on any university curricula on run service management, systems management. I only know of one

module which a friend of mine produced for UCL when he was doing a visiting professorship there, the Royal Academy of Engineering.

[0:56:54]
That's interesting. Because there are standards for service management, aren't there? I mean ITIL, documents how you should do this stuff. But you say that nobody…

It's not being taught. Not being taught. ITIL… who owns the intellectual property for ITIL?

Who owns it now?

Yes.

I think Axelos own it now.

Oh, is it? I thought it was UK government still.

Yeah, well I thought it was CCTA originally.

Yes. CCTA initiated it, Version 1 was written predominantly by IBM for them. Version 2 wasn't, Version 3 was. So organisationally it was OGC, and then I guess it was the Cabinet Office.

Yes, in conjunction with Capita, which is Axelos.

Okay. But I think it's a good kind of reference framework, but a lot of the stuff going on today in the DevOps area is kind of… impinging on it, superseding it, it's more… less procedurally based and more technology based. There's a lot of stuff in DevOps that demand, you know, technology to support it, to support automated testing is absolutely critical to DevOps, for example. Including technical testing, including performance testing.

Yeah.

Which means that you've got to have, you know, access to test environments in order to achieve your DevOps, right, so everything's automated, right? And of course, I mean ITIL's very much processed based, had a good set of processes, yeah?

Yeah.

But, not many people can even spell it, not many organisations can spell it.

[0:58:56]
So we got on to that by talking of the people who operate computers are part of the industry. So all those IT departments in banks and, in banks and shops and government departments, they're all the IT industry, are they?

So one is some work I originally originated actually in IBM includes run. Very important. I mean you're not going to have anything successful if you build it and you can't run it. You only get value when you run it, you don't get… otherwise nothing's achieved. If it doesn't meet its non-functional, its service levels, including performance, availability, etc, then it will have less value, right? So I started at least lecturing on this in my professorship at Plymouth, so that's kind of a part of that. Now, for the last ten years, say, I don't think the figure's changed much, the Gartner figure for keeping the lights on, ie, what does the IT industry spend, what's the percentage in money spent on IT to run it, it's remained fairly constant at 80%.

Eighty?

Eighty, eight zero.

Wow.

Some of the research work I was doing at IBM, which was unique, I still use the same thinking today and as an Emeritus Fellow, I was trying to get IBM to take an industry lead on it, and failed, okay? And thought, well, for a bunch of reasons and some of

the people, often some of the people in the computer industry don't understand the IT industry. We'll leave it at that. But something we call brownfield, brownfield software development, we put a book out – I'm not a very good writer – two colleagues of mine, I sponsored a book along with Grady Booch on brownfield. A couple of friends of mine wrote it and published it in 2008, *Eating the IT Elephant*, brownfield development. Now what our research discovered is, that of the 20% of investment that company – let's say, on average – companies, global figure from Gartner, 20% of the IT spend is on new development. What we found is, because, I mean the computer industry's been around now for 50 years, a lot of companies are still running old systems. You know, there's systems, systems running the UK banking industry, not unique by any stretch, developed in the sixties. Modified, modified, modified, for things like faster payments, online access, duh duh duh duh duh. There's more of it, it's more complex, but there's a lot of old stuff out there which is getting increasingly difficult to maintain. And of course it came to the public eye with Year 2K, when nobody, when we wrote our software in the sixties and seventies, nobody expected it still to be used in the 21st century. So, what we determined was, for companies with new- companies with existing, with legacy IT, our figure was at least 50% of new was spent on the legacy side to enable. Because there's not much point, you know, very rare that you actually put in a new system that doesn't need to integrate with the old system. And you wouldn't put in a new system on your smartphone that didn't talk to the customer system, service system, that didn't have access to your banking transactions or utilities record. So integration is a big cost and understanding it, poorly documented systems is a problem, and that's what we call brownfield development. And our figure is that at least 10% of the IT spend in the world is around that issue of legacy. And it's poorly supported in terms of method and- there's no single tool that can solve this. There needs to be a collaboration of tools to open standards.

Carry on, yeah.

And it's an unknown fact, right? And it's not a problem that can be solved by a single company or a single person.

And is this being taught these days as a discipline?

Well, beyond me, no. [laughs] Beyond me, no. But we should just track back to higher education. Back in the mid-noughties, working with what was e-skills is now The Tech Partnership, there was a kind of cross-industry gathering and I was part of the requirements for what is the ITMB degree that was launched 2006, I think? Think it was 2006, yeah. Which is IT… IT Management Business… Managing… I always get this wrong. Lousy on names. And it took a view of it's not computer science, it's about IT. So, for example, there's a lot of it around soft skills. How do you interact with people, how do you communicate? I went to the curriculum, this year's curriculum and I was pleased to see one of the particular things that I was keen on in communications, because at the time it was reading, writing and talking, speaking. And I said, you've missed one. Listening. You just did it, active listening. What's the point of people talking if nobody's listening? You've got one of these and two of those, right? I think it's taught 12 or 14 universities now in the UK. One of the most recent ones was Loughborough have taken it on, still going. I tried to get my current university to take it on board, but they haven't. It's overseen by a steering committee of industry people, so it's relevant to industry. And it's IT, right? And business. Not, I mean what they teach isn't computer, isn't science at all.

[1:07:03]
So you clearly think that there's a big challenge in terms of developing the right skillsets in the up and coming generation in order to manage the application of technology to business processes or government processes or whatever.

What I am a big fan of, and I guess that goes back to my roots on academic and work and everything else, I do think the increase in the number of apprenticeship schemes is a very positive step forward. Around about 1990-ish, IBM established a scheme with Portsmouth, and to a lesser extent Coventry… polytechnics at the time, universities now, where the degree was half from what they learnt at university and half of what they learnt in training and hands-on at IBM, it was three years. They got paid a salary, there was no tuition fees in those days, you know, and the people were far more in tune with the industry needs and experience. And then some chose to stay on. It was an open thing, IBM didn't sign up to offering you a job and the students didn't commit to taking it, right? Some did, some didn't. Some incredibly good

people came through that scheme, but it was quite expensive. But I think apprenticeships to me is a much better answer to higher education. I just, I think hang on, you're going to graduate with 40 or 50 grand around your neck, and what you're learning may not be completely relevant, back to, you know, all these people needed to run systems that's not taught. Are you being… you know…

And indeed, there are a lot more people doing apprenticeships now aren't there? And the BCS and the government are supporting that.

As an individual I support it too.

[1:09:29]
Let's go back to how you developed in this business…

How I…

Sorry, go on.

Yes. How I developed?

Well, you were there working at West Sussex County Council and then by 1978 you moved to IBM. And I would guess that wasn't a typical route into IBM was it, from school through jobs with other people, and presumably IBM, you know, as I think you've described just now, was in the business of developing young people for itself and would typically take in a graduate or a school leaver or whatever, wouldn't they? But you kind of worked your way into it through experience.

Yes. West Sussex, just a couple of things there. I did some of the most interesting stuff there. But when I joined, I joined because I had graphic experience, they were using graphics to help design public sector buildings when I joined in January '71, okay? They were world leaders in that, driven by the belief of the County Surveyor and his deputy. Then we were doing some other cool stuff. I did a, working, there was a couple of us worked on – just so far ahead of its time in its thinking – we implemented a system for quantity surveyors. You know the role of, quantity

surveyors are responsible for tracking the costs of a building, so we developed a system for estimating the cost of a public sector building and gave them the capability to, as you completed the sub-projects, it would tell you where you were, and we apportioned the budget to the remaining sub-projects. I did the rules engine for that. I didn't design it, I built it. And essentially what we built was a spreadsheet, long before VisiCalc, yeah? And you could have applied it to anything. We could estimate the costs of the building on three basic facts: type of building – a school, say, hospital, fire station; size, so how many patients, how many fire engines, how many students, how many… yeah? And groundworks, because groundworks, so much of the budget can just get it to the, you know, to the level on which you build, which we had, it would be an assessment of the site, yeah? And it would apportion so much to groundworks. And, give you an estimate to the quantity surveyor, which was then tracked. The person I was working with, he then did the bit to heuristically analyse history of buildings to calibrate the algorithms. 1973, pretty cool wasn't it? But public sector wasn't for me, right? I went off to join Altergo, software house based in London. Worked for a number of clients, including Middle East, as I said earlier, the Bank of England. But two of my clients was, two of my projects were with different parts of IBM. So, IBM, I was, the last role as a subcontractor I had with IBM was as a chief programmer and I kind of thought, I want to move out of London, IBM were offering good salary on the south coast, nice place to be. And we mutually let each other know we were, you know, I was available.

Oh right, okay. So you knew them before you, you knew them before you moved?

I was working, I'd worked there for a year, I'd delivered a big project for them, okay? I say, it was an easy route in.

[1:14:15]
And I guess IBM was the place to be in those days, wasn't it? Because the British industry was the newly created ICL and unless you were in the public sector you bought IBM didn't you?

Well, of course, until the eighties, public sector could only buy UK equipment. It wasn't, IBM couldn't tender, it was restricted. Talking about brownfield, ICL is still alive and well in the HMRC and DWP worlds, running on Fujitsu…

Fujitsu as it is now, yes.

Yes, running on Intel chips. It's an emulation, it's a software emulation.

Is that right, yeah.

Funnily enough, Unisys is the same. Also is a software layer built on Intel chips, they don't develop their own chips now.

Let's just put a stake in the ground, that was 1978 then, when you joined IBM?

Yeah.

And just kind of fast forwarding to understanding your career a bit. You stayed there 31 years and you became an IBM Fellow.

Yeah.

What does that mean, what does being an IBM Fellow mean?

Surprised me. [laughs] I kind of thought, because I've been thinking about that with this interview coming, I don't know. I joined IBM and I was arrogant. So having worked closely with, as a subcontractor, and having worked with them as a customer, so I'd worked closely with them when I was at the Bank of England, incredibly closely with them when I was in the Middle East, because they had, I kind of was their placebo support because they didn't have any, right? Not with the client. So I had good relationships. So I was working with IBM, I was successful with IBM as a subcontractor. I kind of thought, well, I'm better than these guys. Arrogant, yeah? And I thought, I can do alright here, yeah? And I only did join for five years, so the big surprise was, I was still there after 31 years, right? And I kind of, yeah, I enjoy

work and I work hard and it's kind of a vicious circle, yeah, in some ways. And a lot of people work hard, but I guess I had a certain capability as well.

[1:17:26]
Why do you think that? What is different about you then?

Not entirely sure.

What's your USP?

It's not political correctness. I don't know. It's just… being able to understand technology. Even today, the new technologies, they're not always new. We work in a fashion industry, you know. Currently, the world's gone mad about APIs, so I've been working in open banking in the last couple of years, which is all about being driven by APIs to access customer information from, you know, other people being able to access our customer information, and all these sorts of things. And it's like, it's APIs, they're marvellous! Yeah, but APIs, I mean I remember the first project I did as an IBM employee, I introduced an API, the late seventies. It's like I'd come from another planet to suggest such a thing, that you didn't embed the codes in a program, but you called an API and it had a structure with different parts and it… Where are you coming from? It's still in production, right? So to kind of settle the argument recently, you know, it's just like they're fashion, they've always been a good software engineering technique. I did the research, the oldest I can find a reference to API is 1968, so they're older than me, my career. They existed before I started, yeah? And now they're in vogue. APIs. Let me get into microservices, right? Let me get into all this. And they have API. And it's like, we did all this new stuff, Chris. And I'm sort of sitting there saying, not all, not all. So I've always managed to be able to get a technical insight.

So the role of the IBM Fellow is the technical innovation, the technical understanding rather than the management of the pounds and the sales and the costs and…

Interestingly enough, it differs. So that's where it originated; the Fellow programme was launched by Tom Watson in 1962 and it was very much about the research side,

very much about hardware, so all the original Fellows were that. Forty years later, the professional services side of IBM appointed their first Fellow, Maurice Perks – you should really speak to Maurice.

He's been interviewed, yeah.

Is he?

Yeah.

Excellent. So Maurice, Maurice was one of my mentors. Most influential mentor I had at IBM, okay? We got to know each other in the nineties and he helped me and developed me and so on, so forth. Now, a services Fellow is very different, because we work in the IT industry, to a Fellow in the computer industry, who's all about, I don't know, moving atoms with the electron microscope, as an example. I couldn't tell you how to move an atom. Okay? So probably, yes, I had a history of performance engineering, I had a history of all sorts of people stuff. I was also where a lot of our big business was, had a reputation for systems integration, big and complex. And Philip Hughes said, the founder of Logica, what is it? It's the best thing in our industry for losing money, best thing we've come up with is systems integration. And so my primary responsibilities as a Fellow in the consulting business, which is where I was, at European level, was health of our client projects and the vitality of the technical community, yeah? And there was a symbiotic relationship between the two, of making sure that we had the right skills to go into the right projects. And the right projects were there for the people to develop. A bit of a frustration, and I did have a responsibility, was actually working out in the different industries what the, how to apply new technologies. But one of the things I did was I did create a number of CTOs – my title was CTO but I never used it, I always used the 'Fellow' moniker, in Europe. And we had CTOs by industry to sort of focus on that, right? As to where the future would go, future technologies. And making sure that we had the right things in place, of which… So, what, for about the last ten years of my career, I owned performance engineering globally for professional services. I secured the investment, I developed the techniques, I developed the training, I owned the intellectual – I didn't own it – I was the custodian of the

intellectual property around performance engineering and professional services as a, purely a very technical point, which you can understand.

[1:23:55]
I mean the shape of your career, if I can try and summarise, it seems to me to be that you started off as the architect of difficult projects and then moved on to formalising the methods to apply on different projects, on difficult projects, and then kind of moved into a role of oversight and review. Is that fair?

That's fair, but not quite complete. [laughs] So, I think there's something- right, the bit that's missing, that I think is relevant, is… So having started at 17, at the age of 21 I was a team leader. Team leader, so then I was responsible for a team for technical concept of what they're doing and also the project management element – small 'p', small 'm'. So I was project managing the team, okay? Then, oh I don't know, another thing, so many people are still like, where's he arrived from. So at the age of 21 I was introduced to Earned Value as a project management technique, yeah? And I railed against it and said, rah rah rah… And I'm an advocate of it still, you know, 57 years, 58 years later, I'm now sort of, yes, it's a good idea. Yeah? And it was a very simplistic way of Earned Value at the time. So, you know, yes, I mean by saying you're the chief programmer or something, it's not just the chief technologist, you have project management responsibilities as well, you know. So I have team leading, the Bank of England I had quite a sizeable programming team, mainly customers working for me. Joining IBM, chief, you know, I had seven years as a line manager in IBM. And I thought it was a good idea, the good idea being, it will expand those skills, develop me, develop those skills. And in those days, it was a real management job, so I was responsible for the task, the people and the budget.

So was that the early years in IBM then, that you're line managing?

I'd been there… just trying to remember. I'd been there nine years before I was a line manager.

Right. So we're talking about the…

Seventy, eighty… no, ’86. Eight years. ’86 to ’92 I was a line manager.

Right.

But a very technical one. So I was technical services, I was global architecture manager for a program product, a package. I spent half my life on a plane, doing. Now, there’s an important point, and that is, I think, I don’t know, behind successful people, they have to have a supportive family. And at some times the work’s really made- I’ve really not been very strong on the family side.

[1:27:37]
I think a lot of people in the industry would have to say that.

And not just this industry.

Yeah.

There’s just a lot of people, right? A lot of… And particularly I think the percentage of successful people, it increases, yeah? You know, so… When you say, what’s your greatest achievement? My kids and what they’re achieving. But that’s not why you’re here, is it? I mean you’re not here because I’ve got kids. [laughs] Yeah? But everybody’s, well, most people have got kids, but they’re not Fellows. So the Fellow thing, yeah, it’s…

So what is your greatest achievement, would you say, in…

Professional?

Professional, yeah.

I… I don’t think I can- probably there’s one project that really, really was successful which was my manufacturing, materials requirements planning project, the early eighties, technically. But there’s been so many. So I’d say my career. My career to me, from an industry, if you like, my contribution and the thing I said at the beginning

of the interview, I am amazed and proud of my industry and what it's achieved, to the betterment of the world, yeah? The world's a better place with… the world could not run without IT – back to run – could not run. We couldn't bank, we couldn't fly. Increasingly we can't drive without, you know, I mean it's everywhere, it's ubiquitous.

It is, yeah.

The world runs on IT. If you had a big switch and you turned it off, it would be chaos.

[1:29:49]
So how did we manage before, then? I mean your career in IT spans, what, 1969 to just, so 50 years. Is that right? Is that the right calculation?

Fifty-one this year. I'm in my 51st year and from the IT Archives perspective, I love this, I will be the only person that covers from the sixties to the noughties, to the twenties.

Yeah.

You've only got three in the twenties. I'm the only… Considering, well, I mean because I started at 17.

Interesting. We have some who started in the fifties, but they're not still doing it.

No. But I did it, you know, spanning decades. I mean it comes back to my timeline. You know, people, you know, people at large, society, use, directly uses IT more and more and that is a trend, it will increase. And therefore the value yet from IT and our dependence on IT and the requirements on things like performance of IT and availability and security and everything else, increases at the same rate.

[1:31:19]

Yes. I mean, let's just philosophise about this for a moment, because it's a subject I find quite interesting that, you know, if you go back to 1969, what was the role of IT in our lives, and looking at your string of projects in your CV, you know, you've been involved in some of these fundamental changes involving financial services, utilities and billing operations of utilities, traffic management, the application of IT to central government, to benefits, car insurance and so on. So all those things that we now accept as absolutely depending on the application of IT, you know, if you go back to 1969, how many of those were critically dependent on IT?

Very, very few.

And how has that evolved over that period of, you know, I suppose, I tend to think because my age – same age as you, isn't it – that, you know, it was all changing most quickly perhaps in the kind of eighties and nineties, but that's just my impression.

I think where it really went through an inflection point was a number of things. I think, although invented 30 years ago, but people get confused. They confuse the worldwide web and the internet. The internet is about the network, the worldwide web makes it usable. So I think that was a significant invention, the worldwide web, enabling things. And then I think…

So that was like 1990-ish, wasn't it?

I think it was '89 because I've recently watched Tim Berners-Lee present the Dimbleby Lecture on its 30th anniversary. I don't know if you watched it?

I didn't, no, but…

If it's on iPlayer, watch it.

Yeah.

It's worth it, because it's quite fundamental. Some very fundamental points. So that was an enabling technology, okay? And I think with that, so around the mid-nineties, then you started to get e-commerce and e-business and things and people buying things and government starting to use websites and largely PC based, so you know, PCs came on stream in the early eighties. Perhaps I should just send you my timeline, which is part of my presentation I gave.

That would be interesting, actually, yes, yeah.

[1:34:31]
And it's, it's not a scripted deck, it's, when we started doing these things, they were called visual aids, not scripts. So the words are in my head, not the slides. But it goes through some of these… you know. So the PCs coming along, the internet was there and beginning to be adopted. The worldwide web made it usable, then that got into the dot.com era. I was key- the dot.com era, there were some stupid ideas that were going round, yeah? I got involved, very few of the ones I got involved with had any long-lasting business longevity. Some of them were just barking. Just barking. And then I think another key thing was, marrying the two, was the iPhone. Now the interesting thing was, you know, the first versions of the iPhone wouldn't talk to WiFi. They would talk to whatever the mobile, whatever GSM, what was it? It was GSM 3, I think, was the first time the iPhone talked to mobile technologies, because of course the US were on their own protocol at the time, yeah? And the iPhone came out in 2007, I think.

I thought it was '6, but it was around then.

I think it was '7.

Yeah, it was around then, yeah. Much more recently than most people think.

[1:36:16]
The tablet, 2010, with the iPad. Few people have heard of Simon. Including you.

Simon?

Simon was a bit of a brick. You know, remember the mobile phones came out in the early nineties, they were brick-like, using analogue communications. Well, the Simon was using analogue communications and it could do messaging, it could do email, it could do calendaring, right? And it was big. Produced by IBM. Didn't sell. Didn't sell. Few people have heard about it, but basically, functionally it wasn't dissimilar, you know, to other things. I mean one of the key things on the iPhone, user interface making it more usable, and so on and so forth. And I think all of these kind of technologies come, you know, have come together, coalesced to make big breakthroughs in this decade. It's not a single technology, it's an accumulation of technologies that have come together to enable some good applications.

[1:37:40]
When you talk about it that way, I mean if you divide your 50-ish years up into two lots then, you know, we're talking, broadly speaking, 1970 to '95 and 1995 to 2020, I mean listening to you talk about it, it's pretty apparent that what has happened from 1995 to 2020 is a vastly greater change to the way people live as a result of IT than 1970 to 1995 was.

I think I'm probably…

Although maybe '70 to '95 was a much more important impact on the way business worked and government worked and more recently it's about how people relate to IT.

Yeah. It's very interesting what you just said, it makes me think. I like thinking. Thinking's good, keeps the grey matter healthy. Yeah? You could probably characterise it as, let's say it might not be '95, but there's some point in time where IT was, with the exception of things like ATMs where it was direct interfacing, a lot of the IT spend and what it was delivering was back office.

Yeah.

And then, with smartphones and browsers and worldwide web and duh duh duh duh duh, there's been much more direct integration with society and computers, yeah? It

kind of built, I think it kind of built with people first of all perhaps, I mean going back to the gaming industry, when they had their first game consoles around the late seventies, early eighties with, you know, Atari and Commodore and so on and so forth, and Sinclair, yeah? And then the PC came along and they could start to do a bit of word processing and a bit of budgeting and so on and so forth, themselves. But when that got connected to the worldwide web, right…

Yeah. That was the breakthrough.

That was a big breakthrough and then tablets coming along, right, was another big breakthrough. So I think, now that's where there was this transition from back office, largely back office in a business sense to having, you know, digital channels and digital based business.

[1:40:40]
And what about the next 25 years then? Or perhaps that's too ambitious, what about the next ten?

Right, now I'm going to pick on my pet project at the moment, okay? Anybody who can say they can predict the next 20 years, don't believe them, right? There's some things that are going to happen and I think it's more of the same, I don't see a breakthrough. Various people are playing with different interfaces, like Alexa, like voice, like Siri for Apple and so on. Possibly something visually. Google glasses didn't quite cut it. So there's something going to happen there. My worry at the moment – this is a concern, it's not for business, it's more philanthropic – and that is I am concerned about a community of people, myself and some colleagues, called the digitally left behind community. And they're the people who can't make use of IT, okay? It could be- the popular belief is, it's just old people, and that's a wrong thing to believe, it's not just age. Age is, age is a factor but it's not the only reason, people say it'll die out. It could be physical or mental ability, some of which is covered by things like accessibility. So, you know, for example, long-term family friend, he's finding Alexa brilliant, because they're blind, and having a voice interface, yeah? But that's not the whole answer, right? It can be trust. Some people do not trust computers, will not trust computers, yeah? It could be affordability. iPhones aren't

cheap, but they've got good accessibility features, yeah? What's the other one? I'll come back to the other one. Oh, the other, the final one is perhaps a combination of all of those things. A lot of stuff we put out there is actually overly complex for the consumer. So, usability is key, good design is key. Even I, as all these years, come across applications which are impenetrable, right? Only last year did I have such an… I just could not find anything, trying to deal with my tax online, so I got in touch with the helpline and guess what, neither could they, and between us we managed to crack it. It was just poor design, really, really poor design. The government, government systems should be an exemplar and they're not. If you take some of those factors, yes I've done some work with benefits, I think, I think, if I take one of my examples, is Universal Credit. Great idea, poorly implemented. It's not just the IT either. It's a combination of IT and the business practices. And when I started this work I was quite surprised, you can only apply for Universal Credit online. You might be lucky and find a job centre that will help you, or local council here will help you with the online bit, if you go in. So people who may have physical disabilities or mental disabilities, or simply haven't got any money, because they need benefit and can't afford a computer or computing device of any type, being forced down a digital channel is wrong for me. And then there was a really good broadcast on the BBC by an academic who's in the same space. Can't remember her name, works for Middlesex University. Had first-hand experience of a Universal Credit beneficiary saying, well, I get a benefit and I'm interviewed – sorry – I've got a benefit and every week I have to report on what I've done to try and find employment, and I have to do that online. I'm limited to two- I've got learning difficulties. He's got no money, so he can't afford a computer. He's limited to two hours a day in the library and there's a queue of people to get access to free, access online, right? And he said two hours isn't enough for me to do that, to feed the monster. So I have to do the rest of it in an internet café and I spend up to 50% of my benefit in the internet café making sure I get the benefit. He's disadvantaged by the process.

[1:46:27]
Is there an answer?

Yes. [laughs]

What is it?

Better design.

Design of, what, the process?

The process that IT's enabling, I think, to be cognisant of the users, to have those kind of use cases in your head, to say well, you know, do people have acc… I mean there's a kind of bubble of, people say, well of course people have got access to a computer. No, not everybody does. Survey came out this week, so there's been an increase, particularly down here, being a rural community, lots of, everybody's, you know, lots of bank branches are closing. I work in financial services, I choose to, it's a good place to be, they treat you nicely. Not just about money, they just treat you well. And, so their digital programmes are there. For me personally, I like the digital channels, eg, one of the projects I worked on recently for a few customers was the new image clearing. Have you used it?

No.

Do you know what it is?

I think you mean depositing a cheque by sending a photograph of it.

Depositing cheques using your phone.

Yeah.

Brilliant.

I didn't know it was working yet.

Brilliant. Yeah, went live last year. Absolutely superb. Because for me, I get very, very few cheques, they haven't been able to drive them out, so I get very few cheques.

Invariably, the greatest delay is they sit on a window sill for a month or more before I actually remember to go and pay them in. And the bank, miles away.

It's interesting. I knew it was coming, but I haven't seen any announcement.

Not all the banks have done that bit. Lloyds have. I think NatWest and Barclays have. So I don't know, but I don't use it, so I knew what it was all about. So that's a great benefit. But, this week's survey is there's a significant increase in people doing their banking through the mobile applications on tablets and phones, smartphones. And a slight increase for people doing it on a PC. And it's the combination of that and telephone banking on the latest surveys reach 79%. Still, 21% is a pretty significant number and my hypothesis is, that's going to get harder and harder and harder, because people, because of the reasons of trust, because of the reasons of cost, because of the reasons of complexity or… or whatever it is, still want face-to-face banking. The last bank closed on the Exmoor National Park two years ago. There isn't a bank. And I talk to my friends and they say, well surely, why don't you just go to- well, they've closed too. I mean, you know, there's nothing.

[1:49:44]
So is anybody doing anything this about this digitally left behind community?

Yeah, there's, we're trying to figure out- so, there's a number of groups. There's one I think been around for three years I'm trying to establish contact with, Dot Everyone.com – it was set up and sponsored, chaired by Martha Lane Fox.

Oh right, yeah.

Funded by charitable duh duh duh duh, and they're acting as a lobby group. There's some, in government, I'm working with, we're working, part of our little group, working with Phil Smith, who's the chairman of the Digital Skills Partnership. He's co-chair with Nicky Morgan who's the Minister for - going to be Lady Nicky Morgan. [laughs] Yeah, because she's stepped out of politics and stayed looking at this, and very much focussed. He's also, I think he's still chair of The Tech Partnership, and formerly he was chair of e-skills. And yes, so there's different groups looking at it,

okay? Now, another good piece of work that is becoming increasingly better is Lloyds Bank produce an annual report on this, right? And the data and their analysis is quite good. At the moment we're doing some work with the Alan Turing Institute to try and do some of our own analysis and trying to figure out, well, we know how to analyse it but where's, does the data exist. We strongly believe, our hypothesis is, that it is a problem, it's not going away, if anything it's getting bigger as technology gets more complex, as more and more pressures… duh duh duh duh duh, it actually not something that's going away. Our second, more than a hypothesis, our second observation, a couple of months ago, I think I made, we were meeting up at the British Library where the Alan Turing Institute is based, is that, I don't know, if there's an assertion that the problem's going away because people are dying, it'll die out. Yes, but as the whole thing moves forward it's just going to perpetuate itself in a different way. And a lot of the, said well, what we've got to do is train the user. The missing element is training the provider for better design. There's a lot of anecdotal evidence around that systems are designed well for accessibility tend to be designed well, full stop. Yeah? So, I, you know, even with my background I encounter poor design all over the place that really makes you struggle to deal with IT, right. And there's too much IT designed by IT on the assumption it'll be consumed by IT.

Yeah.

So we're trying to kind of figure out is, there's quite a lot of people- the work was originally, it was in discussions with the BCS that I got engaged with this and the original intent was to deliver a keynote at the BCS 60th anniversary conference, which didn't happen. [laughs] So we kind of developed something to present that hasn't happened. And then with the help of Ian Nussey we got our paper published by the Royal Academy of Engineering.

[1:54:03]
And you're getting to engage with it now, you're being listened to? Or not?

We're becoming more, we're becoming more aware of more problems. We're also becoming more aware of more people, yeah? I don't think there's a overall cohesive view of this. Certainly I see very little evidence of trying to convince organisations –

it's a term that includes private and public sector – of the importance of this in design. So back to the Universal Credit, I just think that's a poorly thought through piece of design on both a business process supported by IT. So now, if you take that example, if you take banks, so banks, let's say, to me, I very rarely go into a bank branch. Don't need to, you know, the last real need to go into a bank was to pay in a cheque. Doesn't exist any more. I could pay it into a local post office, but now I can do it online at home and it gets cleared in hours, not days. They had to change the law on that. It was a law dating back to the 1700s where the physical piece of paper had to be exchanged between the two parties, the banks, yeah? Now, the law states it can be an image and the paper doesn't have to go between the two. They've changed the law. So to me it's great, but to people in the digitally left behind community it's not.

Do you think somebody ought to own this problem? Take responsibility? Or is it one of those things that's diffuse and you've just got to make everybody aware and engaged in it?

If anybody owned it, it could only be government.

Yeah.

It could only be enforced through regulation and regulation's a bit of a blunt instrument. It can be good, it can be bad, yeah. My work in the utilities, for example, in the nineties was all about deregulating the utilities, yeah? Good and bad, yeah, I think it probably is a good thing, on reflection. In the last, yeah, so it's been live two years now. UK's leading the world in open banking. Driven by regulation, right? Driven by a combination of the Financial Conduct Authority and the Competitions and Markets Authority, but it's driven by regulation. So it's been live two years, okay, and it's increasing function in two years, but nobody's really come along with something, let's say the killer app, to say, wow. You know, at the moment I can, I've got multiple bank accounts, I never close them, I always leave a few quid in, right? But now, anybody, all the big banks who are in banking, the only one, because I've got a Lloyds account and I've got the Lloyds app, I can now log on to all the other accounts through one app, right? It's not really what they were trying to achieve, it's a good usability thing, but they really set it up I think to get the challenger banks, the

new entrants, to challenge the old banks. So it comes full circle. What we discussed on brownfield and the constraints of that, the challenger banks don't have that legacy, don't have those constraints and are agile currently. Over time they will be constrained by their legacy. I can't remember her name- one of the reasons, the lady who set up Starling Bank used to work, I think it's Bank of Ireland, and was frustrated by the lack of agility caused by the constraint of legacy IT and set up Starling Bank, greenfield, yeah? Good app, good this, good that, poof, and then provide all these things. For a time, until legacy catches up with them.

[1:59:08]
So we started talking about this in the context of the next ten years, where are we going to be.

The next ten years.

So do you think these problems will have gone away in ten years' time?

No, no.

There'll still be a digitally left behind community?

Yes. And I mean there's going to be more [alarm going off], one of the things that will drive interactions will go beyond humans.

Yeah.

So part of the open banking regulation is they have, the large banks that have to make their data available through APIs to third party providers. Third party providers are anybody regulated by their local regulatory body in any of it. So, yeah. So, post-Brexit, IBM… sorry, we're still going to keep that, the same regulation. So if it's a third party provider in Romania, it's fine. They can access, they've been approved locally, they can access UK, our UK things, if we authorise it, okay? If we authorise it. But, another part of the regulation is that that third party app can request when unattended, data four times a day, that's the regulation. So you've got, it's interesting,

one of my customers signed up to one of these FinTech, right, one of the more successful ones, and said, didn't see any benefit. Like me, didn't close the account, never accesses their account through the app, but probably that app is sitting there four times a day accessing the data from their other bank accounts without human intervention. So there's going to be increasing amount of computer interaction between things like that, between, you know, AI systems and bots and all. And they're going to all be talking without humans.

[2:01:47]
What's the implication of that then? I mean, people worry about AI don't they, and it sounds like there's another thing there where you feel it might be slightly getting out of our control. Is that a fear for you?

Fear's a strong word, concern, yeah. Yes. I can, it will be interesting as to where it goes. In terms of… people try to make, technologies try to make predictions may not be any better or not as good as people who write science fiction.

So you said earlier on that you felt that there was no doubt that IT had been a force for good, that the world was a better place…

And will continue to be a force for good.

That was the question I was going to ask.

Yes, will continue to be a force for good. But, there will always be some negative implications. I remember seeing Berners-Lee present at the Lovelace Lecture, when he got his Lovelace Medal from the BCS, back in the noughties. And he had this, I always remember it, I can't quite characterise it, but he had this kind of cycle of events that you introduce something and it has benefits and then as it goes through, you have some negative connotations and you fix the connotations and then you get back into the benefits, you know. And I mean given those days, it was something that everybody could relate to, I mean, you know, an application that really started to take off probably around the turn of the century for most people is email. Yeah?

Yeah.

And then the email came along and everyone went, wow. I mean, I'd been using email for 15 years, yeah? In the business world, but then the ISPs and email and everything, you know. I remember his example was, you know, so all that came along and then one of the first negative things that came with email was, spam. Yeah? I mean I get an incredible amount of spam in my junk folder, increasing amount, seemingly, yeah? On all sorts of stuff, yeah? So it's this kind of, most things that bring benefit do have a side effect, you know.

But we have to work to keep the…

But we shouldn't stop.

…keep the benefits positive, yeah.

You know, today most of the things, I look back and say well, you know, the balance of goodness compared to badness outweighs it. But I, I kind of think that the challenge, the challenge is going to change. There's going to be more and more on the, more and more neg… you know, as things progress there'll be, the challenge of keeping the negative things in check will increase.

[2:05:22]
Yeah. Well, that sounds like a kind of good thought on which to think about wrapping up, because we're currently running out of time. I'll just ask you a couple of final thoughts. I mean looking back over your career, is there anything you would have done differently?

[pause]

I think your pause suggests that you're pretty happy with the way it's turned out.

In terms of my career, yeah. No, I'm very pleased. One of the things I, going back to being an IBM Fellow, I was one of the very, one of the first, in the first handful of

people made Fellow in professional services, that's pretty cool. I had to work it out, so the programme had been running 45 years before they made me a Fellow. The Fellows were announced in alphabetical surname order. Being W, I was the last of the class of 2007. And I worked it out, and I'm the bicentennial model. [laughs]

Wow. [laughs]

So if you take 200 and divide it by 45, IBM was appointing less than five Fellows a year.

Mm, quite an achievement.

And at the time, I mean that's- at the time I was appointed, you know, to be one of 70 serving Fellows in a technical population of 250,000, pretty cool.

[2:07:10]
You mentioned some other names of people who have influenced or helped you, I think, Ian Nussey and…

Maurice Perks.

… Maurice Perks. Are there others from…?

Maurice Perks. Maurice Perks definitely as a mentor has been hugely influential and remains a deep friend. To this day we're part of the DLBC thing. Ian's incredibly strong on academia and he still sees me as a bit of an aberration, I think. [laughs] Right? A lot of people on the path, but I think…

They're the two that stand out are they?

Latterly. I think, I mean one other person I would mention, forget, I mean there's so many people in the middle. A couple I'd mention. Dr David Harris. When I started as a spotty 17 year old, he took me under his wing and I guess, hm, he would have been my first mentor, right, and really was influential in those first 12 months, yeah?

I think my manager at West Sussex, I contacted only last year. I said, you probably gave me some of the most valued career advice when I said I was going to leave, which he said, well, what was that? I said, well, you said, as your manager, then there's a great future for you and you could stay and duh duh duh duh duh. As your friend, I'd bite your arm off for that job. [laughs] And I said that was it, that was, you know. And then, that was when I moved to Altergo and I was interviewed by the technical director in '73, we're still good friends, he comes down and stays. Well, that's a working relationship of, the longest one I've got, yeah? We're still in regular contact after over 46 years, yeah?

Yeah. It's interesting. There's a few people who make a real difference to your direction and what you achieve.

Yeah, yeah. And, yes. So, in terms of, I don't know, there's a few things I wish I'd got more, I wish I'd been more successful with brownfield, which I was working on when retirement came up rather unexpectedly, and continued to work on four, five years with IBM, through my, the emeritus, until I realised that I should focus a bit more on my life.

Well, there's loads of other questions I could ask you, but we could go on all day so we probably ought to come to a close. Would you encourage a young person today to go into this industry and…

Yeah.

Yes?

Going back to greatest achievement, the whole thing. Fifty years of fun and enjoyment and satisfaction and, you know, doing stuff. I was just blessed.

What a way to finish. Shall we close there, and thank you very much for taking the time to talk about that 50 years, Chris, thanks very much.

[2:11:17 recording ends]