Capturing the Past, Inspiring the Future

Maurice Perks

Interviewed by

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Welcome to the Archives of Information Technology, where we capture the past and inspire the future. It is the 29th of October 2019, a Tuesday, and we are in the City of London, in the Worshipful Hall of the Worshipful Company of Information Technologists.

[00:21]

The growth of processing power, computing power, storage, and the amount that we can communicate on ever-faster networks is, goes up and, and up, and up. And so often this computing power is used to attempt to, automate as we used to call it, digitise as we now may call it, more and more applications, many of which are actually beyond the grasp of technology at that time. And while the technology is expanding, the applications get more and more complex. And a man who's dealing with that conundrum, and attempting to work out complex systems, and help them work, is making his contribution to the Archives today. It's Maurice Perks, who has been since 1968 in IBM, until his recent retirement, and rose to the heady heights, and they are heady heights, of being an IBM Fellow. And I'll tell you things about IBM Fellows later on in the interview.

[01:25]

Maurice, you were born in Kidderminster, which is a town known for carpets, and it's the south end of the Black Country, is it not?

It's probably, just off the Black Country. People who live there pick up a sort of, beaming of accent, if you, if you like. So, yes, but it, it was more rural than Black Country. It's… And, the industry was, the craft industry was highly centralised on carpets for a long time, but a lot of that has died out now, as, as technology moves on, as fashions move on, as manufacturing moves on, et cetera.

[02:16]

Your father owned a grocery shop.

[hesitates] Yes. When I was born, he was actually in the Army, right.

Right.

So…

Because you were born in '43.

Correct. So… Yes, he didn't then. And then he came back, and then was working for some other grocery thing for some time. And, you've got to remember, it was in the time of rationing, and food was short, but because he was in the, we, we were never short of food, sort of… Short of sweets sometimes maybe. I can remember when sweets became un-rationed, and, we all went and got thoroughly sick on too many sweets. But yes, so, we weren't a prosperous family, but we weren't, if you like, starving or anything like that.

[03:04]
What do you think you got from your parents? Because your father was in that position, and had been a soldier in World War II, and your mother was, the same age as him, and had been a housewife.

Yes.

What did you get from your parents?

I've often thought that question. I'm really not terribly sure. My father was very different to me physically, and, also, over time I realised mentally if you like he was, he was almost… I had a, a brother, who was physically like my father, and was, became a musician, et cetera. I tended to be somewhere at the other end of the scale, in terms of, my likings were much more engineering and building things and mathematical and that type of, that type of challenge. So, when my father was getting towards his sixties, he wanted to retire, he wanted my brother to take over the grocery business, and my brother studied music at Trinity College and whatnot, and became, you know, a degree in music. And my father then said, 'Well, will you take over the shop?' [laughs] And the answer from me was, no, I, I've never been interested in that type of business if you like, in terms of the thing. To me, things were al-, always sort of, more challenging academically than, than the, than…

So both, both boys went to university.

Yeah, I, I actually went to university part-time, as you could do in those days. But, yes, yes. So, we both went to a grammar school.

You passed your Eleven Plus?

Yes. Yes. Yes that's right. My brother was there already. And, and then I ascended, or, went up, whatever you want… And basically… We, we sort of, we both then stopped on to take A Levels till we were eighteen, et cetera, and then my brother went to study music. I did have a place at university directly, but didn't, for some reason, want to go. It's hard to, for me to, other than, I met my, I had already met my future wife then, and so, I, I sort of, went into a part-time employment and part-time education.

[06:15]
Did you enjoy secondary school?

Yeah, I think so, because, I think I played… The only thing I didn't represent the school in was swimming, for some reason. [laughs] I played every sport, and represented the school at every sport you could think of, which was, [laughs] I think my parents were wondering why I was there. You know, I'd come home, and, and sometimes play squash, and cricket, and, some game of football in the same day, and things like that. [laughing] Yeah. Yes.

That side of it, you enjoyed.

Yes.

You enjoyed the academic side?

Yes. Yes.

Because there were challenges there for you.

Yes.

Was that what you enjoyed about it?

Yes. Yes, yes. Yes. There was, there was always this, discovery if you like, as opposed to… I, I never thought… I was never that happy with history, and, that type of stuff, or languages. Because, you, you were always just saying, well, yeah, absorb this, absorb this, remember this, remember this. And I got a lot of absorption. But, if you went into physics and chemistry, and mathematics, you were more or less always discovering something. In other words, you were, you were finding something out, or, or doing something.

Right.

And I think it was that that made me lean towards the, the science end rather than the arts end of things.

Because you did have to, in that period, make a decision, didn't you, at secondary school.

Yes. Yes.

You're in the arts or you're in sciences.

Yes. Yes. Yes, exactly. Yes.

Hardly the twain would meet.

Yes. Yes. Yes. I, I… I'm still associated with the old boys of the grammar school where I'm… And I wrote an article for the old boys' magazine about two years ago about something which I remembered at school that made me think… Well two things that we, we spent so much time on, that were completely useless to me in my career. Right? OK? The first was geometry. I've always been scientific and all that sort of stuff, and working with some of the most brilliant people, mathematicians, but

I have never ever used any geometry. [laughs] OK? That was the first thing. The second was, French [laughs], right, where we, we declined every French verb or gerundive or whatever it was, but we never spoke French, right? [laughs] And I, I live in France some of the time now, right, and, I speak French, and, and none of it really is based upon all that French that we, we'd learn, because it was somehow, you would learn French grammar.

Yes.

Right? Which was intricate in places, and, masculine, feminine, all that sort of stuff. But, to, to me, it, we hardly ever spoke a French sentence. [laughs] So.

[09:38]
You talk about, therefore, it was intricate. Had your interest in complexity been developed yet?

[pause] Pf. I don't… I don't think in that way, no. I think it was much more, that, that came later in my life.

[09:56]
So you leave grammar school, which is King Charles I Grammar School, Kidderminster…

Yup.

…with O's and A's, mainly in science. And you get a job in Brinton Carpets in Kidderminster…

Yes. Yes.

…in 1961. Is that right?

Correct. Yes.

Correct. '61.

Yes. Yes.

And what are you doing in Brinton Carpets?

Oh, so I worked in the laboratory.

Oh right.

OK. And I learnt an awful lot about, textiles, and laboratory procedures, and, generally, trying… And I was always trying to understand something that didn't exist. Like I was trying to, eventually, work out the mathematics of how you match colours, and challenges like that. Because, if you were dyeing some yarn, you had these, these people who were real, they'd spent 20, 30, 40 years at this thing, oh, and it was, 'Oh, that's too red for that,' et cetera. And they were absolutely priceless people, who… And then, there were other people who said, 'No no, it's blue. You need more blue in that.' And you could see these real experts arguing over this. And I, I always thought then, but surely, if you measured the spectrums of these things, you could work out a lot of mathematical, things. And it, but it was looking at that, that I realised, you couldn't do this with a tabulating machine, or a slide rule. You had to have a computer to do it. This suddenly pinged something in my mind. You had to have a processing ability, capability, which was far beyond anything that people could do. I mean, if you look at the, this, almost within the last few weeks, where Google have said they've got the quantum engines working. Oh, all right. And IBM said, 'No, no, you haven't.' All that sort of stuff. They're trying to make this sort of, leap again. It's not quantum mechanics or whatever people are talking about. It's a quantum leap, if you can do it, right?

Yes.

And, basically, we were at that stage in the evolution of, let's call it processing mathematics, that sort of stuff, where you needed to go from tabulating machines and slide rules to computers, that had enormous…

[12:44]
Did Brinton Carpets , Brintons Carpets, have any computers yet?

Yes they did actually, but they were very primitive. Because, they were paper tape based.

Oh right.

And, they didn't have a lot of calculating capacity on them.

Right. Did you manage to use a computer then, for this problem?

I did a… Not for that problem, no. I… I used an analogue computer, and it didn't quite work. So, did they use a digital computer? No.

[13:22]
What was your first digital computer that you met and worked with?

Oh I think that was at Aston University. That was a… Oh, God, what… An Elliott 803.

OK.

We did, we did some mathematics, and…

Because after three years at Brintons you then, as well as working in the laboratory, you went to Aston University in Birmingham…

Yes.

…to do physics, a BSc, lots of, physics and lots of maths.

Yes.

And you were part-time. So…

Yes.

Working during the day, intensive work in the evenings.

Yeah. I used to get a day and a half off and things like that.

OK.

So, yes. You know, it… At that stage, we were… I began to realise that, if you wanted to do something in the scientific world, that I wanted to be in, the technology world, you had to understand computers, right.

So this was an Elliott, the first one you had, Elliott Brothers.

Elliott 803 I think it was.

Right.

Yeah. Yes. Yeah, it was a British one, but, yeah, yeah. As we had a, despite what people said, had a huge lead in computing then.

The 803 was more of a, a scientific and technical machine I understand…

Yes. Yes.

doing data processing.

Yes. Yes. It's… I think it had floating point arithmetic, yes. Yes. Yes.

Hardware floating point.

Yes. Yes, yes.

Great.

Yes.

Just what you need.

Yeah.

[14:59]
And so you realised that you needed computers for these complex issues.

Yes.

You, while working at Brintons Carpets you continued to have your… You got your, your BSc in 1967.

Yes.

So you graduated then. And in the next year, you left Brintons Carpets. Why did you leave?

[pause] I think… Why did I leave? I… At Aston, at that stage, you… It was actually a college of advanced technology, so, they didn't give degrees, but they, they gave equivalent, and they turned it into a BSc. I also… I started on a course that was for, normally it took four years, which was to graduate from the Royal Institute of Physics, to become a graduate, and, there was, there were several guys on this course. It was part-time. One guy was there for the ninth year or something. Because it normally took five or six years, right. And, after, in the four-year spectrum of the course, you, it was the whole of physics, as it was then, including electronics, and including some statistics and, numerical, all sorts of stuff. And, so it was a four-year thing. And my target was to take five or six years. And after two years, my tutor said to me, he said, 'Sit the exam,' the final exam, this year, right? So I said, 'No no no

no.' And he, he gave me some… I've given this advice to hundreds of people. It's… He asked me, he said to me, 'There are two reasons people fail exams. The first is, they don't know the subject, right? The second is, when they take the exam, they don't have the mental, and calmness, the mentality and calmness, to be able to pass the exam. They may have the knowledge, but they can't get it out, right? So the more you do, sit, take exams, the more and more you will get good at taking the exams.' Right?

Good, yes.

So… Anyway. So, I, I sat, I don't know, possibly eight papers or something, something like that. And I can remember the first paper. I looked at the first question, and it may as well have been in Greek. [laughs] Right? I had no idea what it was on about. Right. I carried on. As you do, right? Because I hadn't covered it in the syllabus, And [laughs], I had forgotten all about it, and then, I suddenly got this letter saying, 'Congratulations, you've graduated from the Institute of Physics.' Right? And I don't… And… And I had no idea, right, that… So, when that happened, I, I then got some offers, one was an offer from Canada, was to take a PhD, something, but my wife… And, I got some people from what was ICI then, were asking me to a job. But I was becoming convinced that, I needed to get to grips with this thing called computing, as it was then. So, I talked to various companies and IBM offered me a job.

[18:53]
Did they find you, or did you find them?

Yes. It was very interesting, because I was actually visiting a, a computer department of another company one afternoon when I was on holiday, and the IBM salesman as he was then for this, the company, actually, someone introduced me to him, and he said, 'Oh, we're looking for people like…' It was at a time when IBM was really short of people, because 360, System/360…

Was five years old.

Yes.

Yup.

But was, was really expanding.

Yeah.

And so, they had worked out that the ability, their ability to, sort of, grow the market, as, as IBM was fanatically focused on, was, they needed, one, manufacturing capacity, but two, they needed people who could actually work with customers to *use* computers, rather than, you know, just do the… And so IBM offered me a job. And, I had an interview with them, and I said, 'Well, I… Do you do training?' He said, 'Oh yes. Yes, intensive training.' And they said… I said, 'How long does it take?' They said, 'Eighteen months,' right? And, I thought, that would be good. After eighteen months I'll know everything there is to know about computing. [laughs] I can remember thinking it, right. So I accepted the job, and came down to London, was trained at various places. The training was…

Chiswick?

No. We didn't have Chiswick then. IBM didn't have Chiswick then. It had Lodge Road by Lord's Cricket Ground, and it had… It then moved… Oh, what was the building called? A huge education centre. But… And there was also an education centre in Wigmore Street as well.

Oh yes, Wigmore Street.

Yes. Yes.

Yup.

So…

This was 1968.

In ’69…

’69.

Yeah, and into ’70, yes. Yeah.

Interesting that, about training, because, Sir Anthony Clever, who used, who later on became head of IBM UK, and got a knighthood, said that he was offered a job by Burroughs…

Yes.

…and by IBM. And he asked Burroughs what he would be doing on the first day, and they said, ‘You’ll be selling computers.’

Yes.

And IBM said, ‘You’ll be training. Because we’ll train you.’ And so he chose IBM.

And what, what was his first real job in IBM?

His first real job was…

Was education.

…just like yours. Oh, in education, yes.

He was in education. Yes.

That’s right, he was in education.

Yes. Yes. Yes. Yes, so…

They asked him to do…

Yes.

That's right, they asked him to train on something, and he trained on something he knew about. They said 'Well OK, you can be a trainer for a while.'

Yes.

Mm.

It was…

You knew him?

Well, yes. He was sort of, ahead of me.

Yes.

And he… In IBM, there are basically two trees you go up. The first tree is the management tree, which is basically sales, and all that sort of stuff. Or the second… The other tree is the technical tree, where you, I started as a systems engineer and all that sort of stuff, and ended up as an IBM Fellow.

Right.

And so, you, you go up those trees, and, you, you obviously mix with, with lots of people, but…

[22:21]
Let's just pause and characterise IBM…

Yes.

…in 1968, '69. Does this ring true for you, for the company you joined? First of all, it is a significantly paternalistic organisation, in which there are rules, and there are rules about etiquette, there are rules about treating customers, there are even rules about what you shall and shall not wear.

Correct.

And it is paternalistic in this sense as well, that it would then map your career, and plan your career out. And whether you knew it or not, you were being moved and tested quite regularly. Is that right?

Correct. Yes.

At this time, it was still significantly a hardware company, because it had not yet unbundled software, which it did in '69.

[hesitates] Er…

Yes.

Yes. Yes.

It was international, without a doubt.

Yes.

And it was just reaping rewards from its immense gamble and investment of the 360 development.

Yes.

And it was just laying waste to, the German computer industry, the British computer industry, the French computer industry.

Yes.

Because, the 360 was, it, it was, full range and so on. But it had other computers.

Yes.

Like the little 1130.

Yes.

Which you might remember. Did ever work on that?

Not, not directly, no. No.

Yes, OK.

Yes. Yes.

[23:51]
It's got a branch structure, which is the be all and end all of it really, because everything is organised into branches, sales branches. You must have been attached to a branch,, as a systems engineer.

Yes.

What was your first branch?

It was actually Nottingham.

It was in Nottingham.

Although I lived in Worcestershire, it wasn't connected somehow

Right.

But it was in Nottingham. And the branches, and IBM does this, throughout my career, IBM flip-flops between this, this thing. The branches are either geographic…

Yes.

…in, in so much, or they are industry-based.

Right,.

And Nottingham at that stage was based upon, retail industry, that type of stuff. So it, it had customers who were, Boots, which were in Nottingham, OK, and, it had what was Great Universal Stores, part of which was in Worcester, et cetera. But it was… It also had merged in with it some process industries which were, Dunlop's and Goodyear's and things like that. So…

[25:04]
Sir Ken Olisa I think started in the Nottingham branch as well, and he said he was amazed by… They were convinced, IBM was convinced, before it got Boots, that they wanted Boots as a client.

Yes.

And they had a special taskforce to get Boots as a client.

Oh yes. Yes.

And they got them.

Yes. Yes. And there was Player's as well in Nottingham.

Right.

Et cetera. And so they were, they were all, if you like, there was a concentration on, on various customers. They'd go around saying, 'Well they're a big ICL customer, right, we'll go and get them.' With a… Conversions became big, a big play, if you like, 'We'll convert all your COBOL to our COBOL.' It, it's all the same COBOL, you know, [laughs] it was, it was a fraud really, underneath. But it, it was a brilliant marketing strategy.

It was also, he said, and I wonder whether you'll, you had this experience as well, almost messianic. We are build-, we are offering much better products. Was that what IBM was like then?

Pf. I don't… I don't think it was… I think it was, we're offering a much better, if you like, system.

Right.

Where system is, not just System/360, but, we have better engineers, we have better systems engineers. You know, we have better support. We have, we can go back to the US and get someone flown over from the labs if you like, you know, if we're in real trouble. So basically, I think, it's, it was, IBM was just, just better in its holistic approach to how it gained business.

Right.

And, and there were some, there were some rules that, maybe that, that were, pretty obvious really. And, the strategy was, we will… In, in military terms, right. We will defend what we have, right, defence is the first.

Right.

Then we will gain, then we will grow what we have, then we will… And, it was very much like that. Yeah. So it, it was, I won't see a well-oiled machine. I think it was just a, a set of processes with some really good people.

[27:52]
How did you take to that discipline?

I, I found it, reasonably acceptable, in terms of, I like, I like some discipline, rather than the complete chaos, et cetera, that I could find in other parts of IBM. And, basically, when IBM trained us, they, they actually, it was very interesting how they judged you, initially and, and continued judging. The first was on technical ability, right, can I understand this, do you, you know, do this. The second thing was on communications. You may think I'm pretty bad at communicating with you here now, but, right, when I started at IBM I could hardly [laughs] communicate, or make a presentation, or, anything like that. And IBM spent an awful lot of time, it was the first time I ever got recorded, and we had to go through, making these presentations, and look at them afterwards. And so, there was this communications training, and I don't mean IP addressing or, [laughs] that stuff. I mean, it was, how do you communicate, sat one on one, one on ten, giving a presentation. That was brilliant. Right? The third thing they, they judged you on, and they were always, in the early days, very sort of, foggy, misty about this, was, what they called maturity, right? And, [laughs] the maturity was, a bit like you were touching on, does he wear a white shirt? Right? Has he polished his shoes? Does he sing the company song? Not that we did sing… But, you know, that type of, that type of thing. And, I think… I can remember, when I [laughs], when I finished my last course and training, right, I came out with an A for technical knowledge, right. And I came out… And they only gave one A every ten courses, something like that. I came out with an A minus for communications. And I came out with a C for maturity, right. And I asked my manager about this, and he went, [growling sound]. [laughs] And he was a very nice guy. And he actually said, 'Well, you're actually only 24,' or something. [laughing] They wouldn't give anyone [laughing] that under 30. So it was… But anyway, that, that was the, the type of environment we were in.

[30:57]
The next year was a very important year, '69. IBM significantly changes the whole field by unbundling software…

Yes.

…from hardware.

Yes.

Now previously, here's the hardware, you've paid for it, or you're renting it actually…

Yes.

Because you can't buy it yet.

Yes.

And here's the software for free.

Yes. Yes.

And now it's, you can rent the soft-, you can rent the hardware, and you can rent the software as well.

Yes.

Because we're going to charge you for it.

Yes. Yes.

So, operating systems, compilers…

Transaction lines.

…et cetera et cetera…

Yes. Yes.

…all became part of the revenue.

The operating systems didn't at first.

Yeah.

I was actually in the, in the middle of some of that, and it was a bit chaotic, because, the IBM, let's call it financial side, and, all sorts of contractual sides, hadn't worked it out. I was attached to Dunlop's in, in Birmingham, for Dunlop, when Dunlop's were the king of tyre makers, right. And, what we did was, we put in a transaction management system, which was the first and it was called Customer Information Control System, CICS.

This was called CICS [pr. kicks] in the UK.

CICS. Yes.

And it basically turns what is a batch-operated mainframe, which was designed for batch, into something that can handle telecommunications.

Correct.

And it's a software teleprocessing monitor.

Online.

Online.

Yes. Yes.

That handles the lines coming in, and makes sure things aren't dropped.

Yes.

And make sure transactions are actually completed, or rolled back.

Yes. Correct.

Sophisticated piece of software, which was never given enough credence really. It's a very important piece of software.

Well, it's a… And at that stage, it was in… It had been developed in the US…

Yup.

…in a customer, as, as…

A utility wasn't it?

Yes. Yes.

Yes.

And it was in, the lab it was in was called Palo Alto, where so much technology is these days. And, eventually, CICS was transferred to Hursley, in Hampshire.

Right.

All right? And where it still is, I think.

It's still going, isn't it?

Oh yes. Yes, yes yes yes yes. Now, at Dunlop's, we discovered this before the unbundling. Because you could get it sort of, semi-free, or free then, OK.

Yes. Right.

And, I developed… In fact I wrote a lot of code for it, with about two or three guys in Dunlop's, a control system for their tyre storage, which was huge, right? And we, we demonstrated this, and, oh, brilliant, oh this is great. Right. And, while we were doing that, CICS went from being free to chargeable.

Right.

All right? And, there was all sorts of… No one knew what, what the real charge was. The customer said, 'You sold us this big mainframe,' the massive mainframe, 'and now you're charging us for software with,' with, you know, we had got this system that was coming on the… But eventually… And it was the first live CICS system in the UK. There was, I think, it was the second in Europe. There was, ADF in France had got it.

Right.

Et cetera. So there was this huge wrangling going on about paying monthly charges for software et cetera.

Right. Yes.

But, in general, you know, we, we made the, the change. And then the operating systems came later. The compilers and the transaction managers et cetera were sort of, first. And then, you know, basically, people accepted that software, yeah.

[35:02]
In nineteen… And this, this happened in 1970, did it, the Dunlop system?

'70. Yes. Yeah.

'70.

Yeah I think it was, yeah.

But, in nineteen…

Or ’71. Yeah.

1970, IBM had announced and began shipping the next generation mainframes.

Yes.

The 370.

Yes.

As opposed to the 360.

Yes.

And also, in 1971, there are 111 CICS licences in the world.

Yes. Yes.

So, you were really quite innovative…

Oh yes. Yes, yes.

…your personal work which you did then

Yes. Yes. The second one in the UK, they were trying to beat us, was Allied Breweries, in Britain.

Right.

[laughs] We… I went up there to look what they were doing, and they took me to the, the place in the brewery where you could have free beer. [laughing] Anyway.

You enjoyed that?

Yeah, yeah. Sorry.

[35:57]
In 1969 as well, IBM, it seems to be constantly doing this, and I want you to comment on this.

Yes.

You are a man who is looking now at complexity.

Yes.

CICS was very complex then.

Yes.

Very few people knew how to program it properly.

Correct.

Didn't always work...

Yes.

...in the sense that, it was complex.

Yes.

IBM throws in yet more complexity by bringing out yet another incompatible system, called System/3.

Yes.

Which doesn't have COBOL on it, doesn't have FORTRAN on it. Has this new programming language called RPG, and had as a different size of card. Now this is IBM deliberately creating incompatibility.

[hesitates] No.

Therefore complexity.

You, you're right, but… Eventually, I went to work in, in the real, centre of IBM. It, it… IBM is a very divisional company.

Yeah.

And so, it, the actual, despite what one might think, the actual divisions aren't controlled from up above very clearly. They're funded from up above.

Right.

So, if you say, well there's a, a small market here called… We're going to get into System/3. The… IBM had a thing called the System/360 Model 20, which used RPG, all that sort of stuff. And it wasn't quite a 360, but IBM never said this, because it was, it had a different way of working. All, all sorts of things were different about it. And, they could see this coming in. So, another part of IBM was perfectly entitled to go away and develop System/3.

Right.

OK?

Office Products Division, or General Systems Division, it was called.

Yes. Yes. As opposed to…

DPD, Data Processing Division.

Data… Yes. Yeah.

Which was the big mainframes.

Yes.

And, General Systems Division.

Yes.

Yes.

Yes. So, you were basically…

Also known as the Toy Division I understand at IBM.

Well, yes, it was, yes. Yes. And, you know, they, they went off on other things, and eventually got System/38. All that sort of stuff. But basically, they were… It was IBM seeing a market, funding development, and, more or less, getting something into that market, right? Now, there was always, 'Oh you're going to churn off off the bottom of the 360 market, or 370 market.' But I think it was always something different.

Right.

Because…

OK.

It's a bit like a… IBM's… What I… It's a loose federation, or was, in many ways.

[38:47]

Right. Two things happened in 1970 which are worth referencing. We're not, we're even in the Eighties yet, but…

Are we going at the right pace?

We're going at the right pace, no problem at all.

OK.

And we'll speed up in a little bit.

OK. All right.

One was, that, an original designer of the 360 had broken away, a man called Gene Amdahl.

Yes.

And, in combination with Fujitsu, had designed a top end machine, the Amdahl machine.

Yes.

Which he was selling against IBM 370 top end.

Correct.

And quite successfully. Another thing was, a Brit in IBM laboratories called Ted Codd.

Yes.

A mathematician.

Yes.

Published a paper on the relational model for databases.

Yes.

Now, these two seem to be going interestingly in different directions. Here's more power coming in the mainframe market, and a direct competition to the core of IBM's business.

Yes.

You could have had different tech drives, you could have had different disk drives, from Memorex, Telex and so on. But now, here was someone aiming directly at the processor.

Yes.

Panic. Or not. What happened in IBM as a response to that?

You will remember, I, I worked in the, the very building where Amdahl had worked, OK.

Did you?

About two corridors away from where his office was, OK. Not, not while he was there. Don't get me wrong.

No, right. OK.

And you have to… There is a very intricate, very very intricate, let's call it, counter-play-cum-play. Like this. IBM got the 360, and it knew it was getting the 370, which wasn't that different to the 360, but coming in parallel with all that was the, a system called FS, OK.

Future System.

Yes. Now, Amdahl, I think, there were various people I worked with who worked with Amdahl, said he… He was an engineer. And he believed that what you needed to do was have a very fast engine, OK. There's nothing like a fast unit, et cetera. Other engineers were saying, 'Now, even if we look at Moore's law and all that sort of stuff, the engine speed will only go up like this. Whereas we want the market to grow like this.'

Like.

Therefore, you've got to have multiple engines, right?

Yes.

So Amdahl believed, he, 'Oh I can make a faster engine.' And they did. OK?

And, to the end of his life, he always held that position.

Yes. Yes.

Parallel processing, too expensive, won't work.

Yes. Yes, yes, yes. But it, his, his… His, if you like, his focus, what was in his mind, was, 'I've got a task, so, I'll execute the task.' Whereas, in IBM's mind, was, 'We've got lots of tasks, et cetera. Let's do it.' Et cetera et cetera. So, they were always going to win out, Amdahl was always going to win out on a task versus a task, in, in terms of, let's call it scientific type processing, or whatever.

Mhm.

But the, the bottom line was that, the world, and we've now arrived at the ultimate multitasking of the Internet, all that sort of stuff, the world was going to be multiple tasks.

Yes.

Now… So he, he basically… They… I mean they did very well. I mean, Amdahl offered me a job.

Did they?

Yes. I, I used to live about, in fact I used to run… I used to run past their headquarters when it was in Hampshire.

Right.

And, and I, I knew, this was in the Nineties, I knew then that they were, if you like, doomed to have lost, in, the actual architecture of systems. Because, Amdahl's mind was in a different architecture place to IBM.

Yes.

Right?

[43:23]
OK. So Amdahl was able to use chips which were made by Fujitsu.

Yes.

Which had cooling towers on them.

Yes.

Which meant that they could be cooled by fans.

Correct.

IBM was using chips in its, in its mainframes, which needed chilled water.

[hesitates] Well… That, that's a big, that…

No more conduction units, they were called.

Yes. Those were in the 3080X series.

Yes.

Yes. The answer to that is, it's, it's not just, not just… I've got a presentation, I could probably bring it up very quickly, I used to give, where, it went up, about the heat dissipation from chips, right. I used to give it to all sorts of people. And then, at the very top, right, I went, da da-da da-da. And today they, they've still got them. The very top, I had the hottest thing. [laughs] I used to bring on a vindaloo [laughs] curry, right? OK. Now… And there were lots of arguments then, that you, in IBM, you couldn't get a, a three-bit chip to be air-cooled.

Right.

Et cetera et cetera. And they were all based upon, sales, salesmen, and techniques, and all sorts of things. Whereas, you know, you've got that thing there, which is massively powerful.

That's your mobile phone.

Yes.

Yeah.

Yeah, sorry. So, the answer was, so basically, it was people saying, could we make… The actual water-cooled versus air-cooled argument, wasn't that important really.

OK. What was important though, was the mug, wasn't it?

Yes.

[45:12]
Now, Amdahl had read that IBM was big blue.

Yes.

And so Amdahl salesmen would go around to IBM users and give them a red Amdahl mug.

Yes.

Which the, then, the IBM user would have on his desk, when the IBM salesman came in.

Yes.

And apparently, the price of the mainframe would go down by about a million dollars.

Yes.

And it was called the million-dollar mug.

Yes.

Is that apocryphal, or is that true?

Oh no, I think there's, there's quite a lot of truth in that. Yes.

Right.

They… I, I spent quite a lot of time, before I went to work in the US, in Amdahl situations, and, it was, it was, a lot of it was due to, I would think, an arrogance by IBM that was there, as opposed to the brilliance of Amdahl.

OK.

OK?

Brilliant engineer though he was. I remember interviewing him. A very modest man.

Yes. Oh yes, yes, yes, yes, yes. Yes.

Almost constantly, it seems to me, in pain, because of his back. He had terrible back problems.

Oh, I didn't, I didn't… OK, yeah.

[46:27]
1971, something else happened.

Yes.

We'll get out of the Seventies soon. Something else happened, which was the 3270 display.

Yes.

*Now this became **the** ubiquitous display.*

Yes.

Because now we're talking about a lot of online systems, with CICS as the software.

Yes.

*And the 3270 becomes **the** display, does it not, made in millions.*

Yes. Well there was one called the 2260, before that, OK?

Right. OK.

Which, I actually did a lot of tra- When I was training, I was at what was Kays of Worcester then, and they had mail order.

Right.

They had a room full of girls going, [swishing sound] at these 2260s. Green screens, OK.

Yes.

And the 3270 came out, et cetera et cetera. And there was something interesting, I really, and I still think about it today, right. There was a man in IBM, in White Plains, which was a sort of, semi-HQ up above New York, by Armonk. And, he had a graph, which was, the growth of mainframes was proportional, or had a mathematical relationship, for the number of terminals that was out there, right? When you thought about it, it's quite obvious, right? So IBM would say, 'Right, we'll get more terminals out.' Now if you think what's happened in the Internet and everywhere else, right, the more these things you get, the more compute power you need to support them, and communications power. So the end user, end points, are very important, and what IBM did was, with the 3270, was more or less then say, 'Right, we will have lots of 3270s.' And because we had got CICS, and another thing called IMS, and for, we got TSO, and, VM/CMS, all that sort of stuff, the software was there to actually connect them.

Right.

Right?

[48:28]
And, we've got relational databases coming through…

Yeah.

…in the later, mid-Seventies, '73 '74, DL/1, '74…

Well, DL/1… DL/1 wasn't relational. No.

It wasn't?

No. It did…

Was it a network?

No, DL/1 was hierarchical.

Hierarchical.

Or is hierarchical.

Right, sorry.

Yeah, OK. Yeah.

System/4 is '74, System R

Yeah.

…is '74.

Yeah.

And then IBM tried to draw the whole thing together, in a big architecture called Systems Network Architecture. You presumably came across that, did you?

Well, it, it couldn't pull the mainframe, all that… SNA was a magnificent movement which, which fuelled a lot of that connectivity with the 3070s, right?

Right.

And what it did was, actually, say, we're going to have protocols, and we're going to have sessions between the devices and the, the mainframes, whatever it is, and, we will be able to communicate, on a transaction basis, and try and make the software common if you like in there. And SNA came out of Raleigh in North Carolina, was a magnificent step forward, to rationalise what was all sorts of weirdo communication things, like, you know, teletype, swift, you know, all, 6-bit codes and, all that sort of stuff. So…

And you had your own protocol. SDLC.

Yes.

You decided not to go for an international protocol like X.25. Typical IBM, we're not going to do that.

Well, no… X.25 was at a different level if you like.

OK.

But, SDLC was, something which was built upon a thing called BS… Binary Synchronous Communications. So you basically, it said, we've got to standardise this. If we looked at X,25, X.25 was the packets at a much lower, almost a physical level. So, IBM did support X.25, but you, you would have SDLC sitting in the heart of it.

At a higher level.

Yes. Yeah. Yeah.

[50:54]
You then, you are obviously spotted in IBM. You are moved around in the sense of supporting crucial customers.

Yes.

The CICS application in Dunlop for example.

Yes.

You worked with Rolls Royce.

Yes.

And, helped them. And then, in the early part of the 1980s you are move to the US. You're offered a job in the US, are you?

Yes.

What job was that?

It was actually in the holy of holies, which was, in the System 370 architecture group. In other words, there was a, a small group of people in there who had… You could… You could walk down the corridors, and the people who… You talked… You could, you could ask any question. Why… I'll give you an example. Right. I don't know if… Do you know the assembler language?

Yes, unfortunately, yes.

OK. Right. Now, I had always puzzled… I, I love the assembler language. It was…

This is a really low level language.

Yes.

You're driving the machine, basically very close to machine code.

Yes.

And it's, it's not allowing you to basically, read or write or format things You've got to take it right the way down.

And only. I always… I keep saying to people, if you want to understand how computers work, all of them still, learn the assembler language.

Yes.

Right. Now, there's an instruction in assembler that's called the move instruction, move characters, MVC.

Right.

Right? And what MVC does is, it moves operand B to operand A. Right? And I always thought, oh God, it should really move operand A to operand B.

Right.

So, I, when I was in, [laughs] worked in, in Poughkeepsie, in, in the holy of holies, I asked some of these guys. And they said, 'Oh,' they said… I'm not quite sure why this, but, 'Go down there and ask Ed Junior so-and-so.' He was the man who, who understood the MVC in the 1400, where it all came from or something. So I went down, and we asked. And I said, 'Why did you do that?' He said, 'Oh, I didn't.' He said, 'It was A to B, but I then thought, maybe B to A is faster. So I changed it.'

Right? And, he said, 'And, while my chains, they were waiting to do the performance of it, was in there, with the thing, this would be people' I guess like, Amdahl, or the like, 'they froze it.' [laughs] Right? So it became B to A. [laughter] I, I wasn't allowed to change it back. Right? And you could ask questions like that.

Right.

And I… God. You know, this is like, getting to the start of the universe…

[53:41]
Poughkeepsie is in, upper state New York.

Mid, mid.

Mid New York.

Yeah. Yeah.

Also, interestingly, relatively near to the headquarters of IBM.

Yes.

Which was in Westchester County.

Yes. Armonk.

Poughkeepsie is also the big manufacturing place for the biggest mainframes.

Huge. Huge.

Yes.

Yes, yes. Yes.

And you were shifted there?

Yes.

What was your job there?

I… I was in this group of people who were, we were designing the next mainframe and the mainframe after that.

Right.

And my, my job was to… I… Remember, I had been in Rolls Royce when they were at Derby, when they were trying to rebuild their computing. They had gone through a crash in '71, and, in the, in the Seventies they were in bad state, because everything… And, the Government was then giving them money. And there were some absolutely brilliant people in, in Rolls Royce. And, they had got these mainframes here, and this bit, that there, and they had got some stuff in Bristol. And my job was to sort out, help them sort out this, let's call it complexity of the stuff, right? They had brilliant engineers who wanted… They had actually bought an Amdahl, because the engineer said it was faster than the IBM [laughs], right. And they had had some IBM multiprocessors in there that had been, not very well, not very good in terms of their reliability. OK. So I, I had all this vision about how, how this complexity was coming, and what was really needed as, over the next one or two generations.

Mm.

[55:30]
So I, I was shipped in to there by, someone, I don't, never a million per cent sure why, who it was. Did you interview Geoff Henderson?

Not yet.

Oh, OK. He has been interviewed here.

Has he?

Because he wrote… Yeah. OK.

I didn't.

Geoff Henderson was the, the sort of marketing manager at Rolls Royce for IBM. And, and, et cetera. Anyway. I, I got shipped in to this group, who were thinking forward about, what the mainframes would look like, what systems would look like. And they started to ask me. And I said, 'Well, it…' Maybe this is, was stupid at the time, but it, it turned out be… I said, 'We can find out this.' And, 'Oh, where?' 'Well, we'll go down to Research, and…' You know. 'Yeah, we'll go down to Research,' which is York Town. And we got all these boffins who understand what the chips are going to do, and all that sort of stuff. I said, 'We'll do that.' So, go to Research. And then, what we'll do is, we'll go out, and we'll talk to some really key customers. 'What do you want to do that for?' I said, 'They will tell us, they, not in direct terms, they will tell us what it is that, they're thinking. Right? It'll be in their minds.' Because I, I had, I had learnt this at Rolls Royce, and, and a few other places, right. If you, if you sit there long enough with someone who's good enough, they will tell you the answer to their problem. So, I used to go, I would get… We did some studies, and we, we'd look at places. I did a lot of work with AT&T. Because they, they had a, [laughs] they had this, this billing system and this, this system which was, consuming mainframes, and they had to make new mai- It was… What was really the problem here, we went to Boeing and we looked at some of Boeing's stuff; we went to Bank of America; we came to Lloyds Bank here, et cetera et cetera. Because Lloyds had got this plan. Lloyds at that stage could see Internet banking. They didn't call it that, but, but they could *see* it. There were one or two people in there. And, you… I said, well, this, this is what we've got to…

[58:03]

So, I would take some of these guys round, and I took my boss once down to AT&T, in New Jersey, and, he, he's just retired from IBM. Absolute brilliant, brilliant man. He, he designed the, the most complex computer part, the 3033 thing. And he had it on his wall, right, of, how electronically it worked. And he, he used to show me how it worked. And I took him down, I took him down one day, and he sat there. And, I

was there with these guys from AT&T. And, we led, we went through all this discussion, with paper all over the walls, and, you know, all that sort of stuff. And after, we were driving back, and he said, 'Maurice,' he said, 'how did you know how to do that?' I said, 'What do you mean Jim?' This is the most brilliant design I've ever… He said, 'To talk to these people like that.' And, I think it all came back to me, was, a combination of my, let's, let us look at a problem, and its complexity, and try and break it down.

Right.

Plus, IBM's training on communications.

OK.

So, you know, there was… I, I really enjoyed these people. They were, they were just absolutely… Some of them were just brilliant, in terms of their, you know, what they had achieved, and, the way you could talk to them.

[59:46]
We come to a year which I call IBM's year of hubris, which was 1987. And why I say this is, because, in '81 IBM had introduced the PC, and broken its own rules of development, and gone out and got the processor from Intel.

Yes.

The software from Microsoft.

Correct.

And basically, did a very clunky, horrible job of an interface.

Yes.

And, and eventually got it a bit right, with the PC AT.

Yes.

But… OK. Creating great waves, et cetera.

Yes.

And then in '87 IBM had launched then what they called the PS/2.

Yes.

Which had a different operating system, OS/2, and a different connectivity.

Yes.

And it turned round to the rest of the industry and said, 'Oh by the say, if you want to use this new connectivity, called MCA, you're going to have to pay for what you did on the PC AT, and XT.

Yes.

And Compaq said, 'No.' Compaq then – IBM, lost control.

Yes.

It also announced the same year an attempt to do something which I think was, might have been close to your heart, which is to simplify and systematise the application development process in an architecture called Systems Application Architecture, SAA.

Yes.

Basically to do to applications development, what they had done to networking in SNA.

Yes.

And SAA failed.

Yes.

Did it not?

Yes.

Were you involved in that in any way?

Only in saying, it's going to fail. [laughs]

You did say that?

Yes. Oh yes.

Why did you say that?

Well because, the, the people… When I was back, and I'd go back to the Santa Teresa lab, where it was headquartered, sort of, in California, south of San Francisco, quite a bit, and the people… What IBM has… What it has a penchant for doing is saying, 'Ah, what we've got over here is, LUMP A, right?

Is…?

LUMP A.

LUMP A.

Yeah, whatever…

OK. OK.

Well OK.

LUMP A.

I want to show something.

Yes.

Now, LUMP A, the business is going to go down over here, right?

Right.

Therefore, we've got all these people over here. They used to say this, right. And therefore… But we know LUMP B over here is going to be big. So we'll move all these people over here.

Right.

[1:02:21]
Now what they did was, they had a lot of people there, some of whom had developed the relational database, all that sort of stuff, et cetera, and some of whom had worked on OS/2, and some of whom had worked on this, that, the other. And they had put them on making SAA. But, they didn't understand application development. What they understood was, infrastructure type operating system, transaction management development, and not what the people in… There was one famous, there was one famous, I can come back to this in a moment, occasion when Lloyds Bank came over. I went with… I used to go to Poughkeepsie, right, and people were talking to me about SAA, there was coming all that sort of stuff. And, 'Oh we'll able to do this.' And, I can remember one guy sat there, he was, they were mesmerised by, 'What are these people talking about? This isn't how you develop applications,' right? But they… And, so, they, they then sort of said, 'Oh…' And of course, you know… And people are going to code, you know, are going to code in C, and all that sort of thing. And, you know, the, the universities are turning out 20,000 programmers per

day in C, and all this sort of stuff, right. Oh… And I remember this guy, he looked at them, and he said, 'All I want in the bank really is one programmer. Well maybe two, in case the one goes on… [laughs] Right? And they didn't understand this. And, IBM, if you, if you look at me and you say, 'Well, why is IBM not the number one technology company today?'

Right.

I'm going to get into suable areas here, but, OK. It's not the fact that they gave the operating system away to Bill Gates, et cetera. It's… There was, something in there. It's the fact that IBM has never understood application programming.

Right.

Right? There's this… It's almost a bit like… I… I don't know an analogy. There are certain nations that can't do things.

Yes.

Right? [laughs]

Something about the culture, something about…

Yeah, something, something about the culture, yes.

The organisation. It just can't do it.

Yes. The genes… I don't know where you would put the bottom of this, right?

Yes. I can't play tennis. It's something like that.

Yes, that's right, yes. Yes. Yes.

OK. OK.

And so, IBM completely and utterly misunderstood.

OK.

And, I think the, the industry is still misunderstanding. But, if you look at people like Apple et cetera, who opened up everything, all the programming interfaces, right, the, the… SAA was just, there was, there was nothing there.

Right.

It was… They kept calling it architecture, then a framework, and, people would look and they'd say, 'You can't make a, a computer like that,' right?

[1:05:48]
OK. You, you've pointed to today, and the complexity of systems today.

Yes.

And the problems of application programming, which is exactly your area, which became your area, really. Yeah.

Well, yeah, I'm not an applications… Yes, go on.

Does it… No, but, but you, dealing with complexity.

Yes.

What do you feel about the fact that the most popular software development tool is JavaScript?

It…

Doesn't that make you feel sad?

Yes. Yes. If you look at it, a) I, I love Java from the point of view that, it's the first real language that I would say is, is portable and mobile.

Yes.

Right? Like I can have a bit of Java in here, and I can have a, point to, a bit of Java in my iPad, a bit of Java on the mainframe, et cetera et cetera. And, and it gets transmitted, and, all that sort of stuff. So that is absolutely, a great underlying architecture, if you like. But then you look at the syntax of it, and, and you go, is this any different to C, or is this any different, is this any different? If I look… And I, I led a study for the IBM Academy, Technology. This is probably not in, in my stuff there. I co-led it with another IBM fellow in about nineteen, about 2002, 3, 4, right?

Yes.

Where we called it, we called the, the study, it was the, the Business-IT Gap. Right? In other words, there's this huge gap, and it's still as wide as when I were a lad, between what the business wants, and in its business thought, and what the IT department, or whatever you want to call it these days, can actually deliver, right?

Yes.

And you go through this, I've got 100 presentations of this, you go through this… I've got one slide where, it goes from the business person saying, 'I want, da-da-da-da,' and then it goes into the, what we'll call the, the business analyst, sort of goes, 'Oh, right, now, we, what we're going to do now is, we're going to put this into this,' ra-ra-ra-ra. Then it goes into some sort of, software architecture person. Then it goes to be coded. And then, it goes to be tested. And, and let's bear in mind, testing is the most, horrendous challenge these days to get… It goes to be tested. And then, someone shows it to the business, and they say, 'Well, that isn't what we wanted.' [laughs]

Right. Yes.

Now, for all this, this thing we've got, we still don't have a way that business people can program a computer.

Of course it was said about COBOL, that they would be, because it was files of records and so on. And of course they didn't.

Well it's nearer than Java.

[1:09:05]
Yes it is, much nearer than Java. You're absolutely right. What about this new approach, or, or I don't know that it's new necessarily, but it's called low-code/no-code.

I, I haven't really looked at that.

OK.

I, I keep looking at stuff like, agile development and stuff like that.

Yeah. Yeah.

And I go, my eyes glaze over and say, well, what, what are you guys… You're just reinventing stuff that people have been trying, years and years.

Right.

So…

[1:09:31]
Let me test you on, waterfall, which is the discipline approach from specification down to testing and maintenance, don't forget maintenance, versus RAD, rapid application development. Where were you on that debate?

Well I, I looked at RAD, et cetera, and, you sort of, said, well, the title's good. I think everyone, every businessman's going to say this. But then, you looked, and you saw, well what tools have people got here? You still needed to get RAD IT professionals involved to actually, go. Now, you, you… One of the, the things that RAD said was, well break it down into small pieces.

Yes.

Right? You try breaking a big banking system down into small pieces.

Yes.

Now, you can do it initially. And I, I got called in, I got called in to something that, in Brussels, where I spent about, fifteen months, with a project that had got so badly… And, this lady, who was a very clever lady, in, in this clearing house in Brussels, huge amount of expense, said to me, she said, 'Can you tell me why we developed all these objects?' And, we had a, a traffic light system, and it was green through sets, and every object, we wouldn't get it go forward until all the objects were on green, or we knew how to get them to green. Yeah? So when they put them together, not one of the, the ones talking to the next ones, ever worked. Right? And it's, for what you break down, which is a good idea, you have to put back together.

Right.

You know, and if you look at the great engineers of our time, they can actually, from the bottom, actually, see how you, you build the great bridge, or whatever it is, right.

You're raising another issue, object oriented programming.

Yes.

That was the big, the big, the big thing for a while.

Yes.

And, tools were developed. But you are saying, very often, if you follow the tools, if you follow the rules of object oriented programming, when you put it together, they didn't actually communicate properly.

Oh yes. I don't… Or, you still, if you look at most systems these days, the testing load on them, the testing time, is the, the greatest effort.

Right.

And that actually shows you that, the process before is flawed.

[1:12:22]
In the 1990s, in the early 1990s, you were back in the UK?

Yes.

Came back, for what job?

[hesitates] I… My wife was then, wanted to stop the US. They offered me, stop in the US, go into Research or something like that. Research in IBM is, an incredible hotchpotch of brilliant people, and, and, all that sort of stuff. And, I, I didn't want to do that. Also, my mother and father, and my wife's mother and father, were, were getting older. And so, we decided to come back. And I was initially, in fact I was based in Chiswick at first, looking after big, big systems, and trying to get development, that I was still working with, right, basically, closer to some of the customers in, in the UK, especially the banks, et cetera et cetera. And, I was not happy doing this, because, we were flailing around, IBM was flailing around. And IBM was failing, right?

Big time.

Yes, big time.

It had, been making losses.

Yes.

[1:13:56]
But then one day, the chief executive went in and said to the board, 'We can't pay the dividend.' And he was out that day.

Yes.

And they brought in a man from outside.

Yes.

Never happened before to IBM.

Yes.

A man called Lou Gerstner, in 1983.

Yes.

Used to be in American Express? American…

Yeah, he had been at American…

Nabisco as well.

Nabisco. Yes. Yes.

Yes.

Yes, yes.

And, all change. What was it like being in IBM in that, 1930s[1980s], in that crisis period?

It was, it was actually, really really exciting. Right? Because [laughs], for… We knew something, we knew something big was happening. Like, if you, if you were in any sort of job, sales, or, SE or, anything in, in the field, you knew that your pay came from selling the products. Right? And the products weren't selling, or they were having to discount them, in the PC World and all sorts of other worlds, by a huge amount. So the actual support costs, as they were then, which were quite huge, were being trimmed down. Now what Gerstner did, and he brought in a man called York, was, he just…

He brought in…?

A man called York.

York?

Yes.

y-o-r-k?

Yeah, y… Oh, I think… His surname… Oh. He had been with him in, somewhere else.

OK. Mm.

[laughs] What they did, was actually just, cut out everything that was going on, and, take away, the thing. I was at one of the, an Academy meeting, where Gerstner said, 'We are going to stop this stupidity of multiple developments,' right? He said, 'I have personally,' he said, 'stopped the development. I found three tape library systems that are being developed. People have asked for money. And I've stopped the development of two of them,' right? And some whack behind me said, 'Oh he's only

found three. He hasn't looked very far.' [laughter] Right? Now, that was, that was, if you like, characterising what was happening.

Yes.

And so…

The paternalism is going, is out.

Yes.

For the first time IBM is making redundancies.

Yes. Yes.

The whole culture is changing.

Yes. Because… Now, what, what we did, and we did… I was based in Basingstoke at this stage.

Right.

We actually didn't know what we were doing. Because IBM was then saying, 'We're going really into consultancy and services in a big way. We're going into services and consultancy.' And, it was an incredibly interesting time, because, we all thought… Everything had been handed down, a bit like you, you talked about the early IBM and Clever and all that sort of stuff, right? Everything had been handed down to us. So we thought, my God, it's all going to come down from Armonk, right? That, tablets of stone are going to come down the mountain, and this is how we're going to do it all. And, I, I started going backwards and forwards to the US looking at various things. And, got more and more puzzled by these guys, who were trying to get… They had moved all sorts of people out of sales and, and that, and development, and manufacturing, into this work on how to set-up services properly. They don't know what they're doing, these guys. Customers are never… They don't,

they don't understand customers. And so, we, we basically then said, 'Right, unless we go out ourselves and earn money, we'll charge for contracts,' which you could do. We had better… We're going to be made redundant, right? In, in other words, we said that, there's no free lunch.

Yes.

OK? And, I then… We then started, over here, with some guys in Canada, going out and earning money. And IBM was not giving us any… And I kept looking at what the US were doing, and they were doing stuff based upon, oh, you know, we'll go out and do consultancy, and here's the method. And what you do is, you, you ask what the problem is, but the answer was always, OS/2. Right? [laughs]

Yes. The answer is, always a product.

Yes. Yes.

Yes. Which you are incentivised to sell.

Yes. Yes.

Whatever the question is…

Yes.

…this is the product for you.

[1:18:43]
So I, I was over here. And then, I suddenly realised that when we were out there designing systems for the banks or whoever it was, we didn't have… I had seen the, the ways that IBM had systems to design mainframes back in Poughkeepsie. Brilliant. But we didn't have systems which could design systems for customers.

Right.

There wasn't a, a process, there wasn't a, a structure. So I put forward a, a proposition that we designed a design method, called the end-to-end design method, for IBM services to, to use, in customers. And, the US was trying to get me fired at that stage, kneecapped, and all sorts of people saying, 'They don't know what they're doing, these guys.' Right?
[1:19:45]
Now I led a project in Raleigh in North Carolina for about a year or more, shuttling backwards and forwards, designing a method by which we could design systems, and teach people how to design systems.

Right.

And, so we did that. And we started making quite a lot of money, in terms of, supporting ourselves, and getting profitability to our whole environment. And the US eventually followed suit, saying, you know, this is… So it was… We didn't really know what we were doing. For the first time in my career in IBM, nothing was coming down from the heavens.

Right. Or nothing that made sense to you.

Nothing that made sense to us.

Yes.

And nothing was, was happening that told us we were wrong. And so, we, we just, carried on.

[1:20:51]
So in this period of crisis…

Yeah.

You basically… They had created, unknowingly, a space in which you could operate.

Yes.

They were sceptical of you.

Yes.

Someone was trying to, some people were trying to get you sacked.

Well yes, they were all saying, 'Well we'll not support that,' ra-ra. 'Stop them, stop them doing this,' you know.

Right. But you had then developed an approach to applications development, which was the framework.

Well, a systems development.

Systems development.

We didn't, we didn't attack the application per se.

Right.

We attacked the infrastructure.

Right.

Right? Because, we were getting… Now, SAA was supposed to have filled the application space, and all sorts of other things.

Yes.

And it never did. And in the end, IBM went out and bought some products.

Yes.

Like Rational Rose, and those sort of things, to try and do that.

Yup.

[1:21:46]
But basically, they didn't, if you like… [pause] They couldn't stop us. [laughs] We just… And, I, I suddenly realised something about IBM. You talked about the paternal thing, right?

Sure.

And all those rules. And I've said this to a lot of people I used to mentor. I actually said, if you make a mistake in IBM, IBM, unless it's a really crass mistake, is very forgiving. Right? If you admit to it, and suddenly say, 'I've got this wrong, sorry, I've done this wrong.' IBM could be a very forgiving company, like that, rather than, et cetera. And it's much better to do that, do something, than, not to attempt it, because you are afraid of the rules et cetera. OK?

Yes.

So, it, it was, it was a very interesting time.

[1:22:49]
But the wind then changed, did it? Because you then went into, more into research, did you?

Not that…

I mean how did you become an IBM Fellow?

OK. I… about the method et cetera, be… I also then moved my attention to… I was… There's a, a hierarchy. I think by the time, I was a Distinguished Engineer,

which was one… I… To, to a certain extent, to outsourcing, and why we were getting into so many problems with outsourcing, et cetera, and how did we fix some of these big problems that we had in outsourcing. And so, I then started to try and help the outsourcing people, sometimes on very large bids, or sometimes on very large projects that had gone wrong, et cetera et cetera. And I'd do all sorts of other things, like, for about two years I was the, let's call it, along with someone whose name is the same as yours, someone called Trevor Sharpe, he's died now, we were the technical auditors of the London Stock Exchange, after TAURUS, right?

Which was, a disaster.

Well [laughs], mega disaster. Yes. Yes. [laughs] And I remember, for about two years… There was great discipline. Every month we had to write a one-and-a-half-page document. You, you could go over one-and-a-half-page for the board. And, Andersen's as they were, Accenture as it is now, were installing the system. They were all tandem systems, all that sort of stuff, right? And we had to work with Andersen's to actually say where the project was, after TAURUS. And we had to write, one…So, I was doing things like that, and being paid, you know, quite a lot of money, wow, IBMers being paid a lot of money. So, I was trying to sort some other things out in the States, and then, I was travelling around Europe all the time, trying to bail out various projects that were in deep shit – sorry, deep trouble. And, and… So, I was the go-to person if you like.

Get Perks in.

Yes, that's right. If you had a real big…

Fireman Perks is here. [Laughs]

Yes. I was the sort of Red Adair, you know, of things like that.

Yes.

[1:25:31]

And… And, we also developed the, what was probably the most complex system I've ever seen, which was a system called the CLS global foreign exchange system, right, Continuous Link Settlement Which is… All the world's foreign exchange goes through this, right? I don't know how many billion dollars a day, or trillion dollars a day it is, but it's huge. It's huge, huge, huge. And, I, I sat with that thing in all its, with all its problems, and it was based in the UK, the execution of it. And, so, I did that. And that, that had a huge… I mean, Gerstner and all those sort of people were getting monthly reports on that system, and things like that. So, I was, I was sitting at a, a very high level, and my publicity if you like was [laughs], you know, in terms of…

You were getting a lot of internal recognition.

Yes. Yes, yes. Yes.

And they made you an IBM Fellow.

Yes. Yes, yes.

[1:26:49]
I've spoken to a number of IBM fellows, one of which was Ted Codd.

Oh yes. Yes.

English mathematician. And he was at, he was at the Thomas Watson laboratory…

Yes. Yes.

…in New York.

And then he, he moved to California.

Did he?

Yeah I think so, yeah.

San Jose.

Yeah. Yeah.

And I also talked to a man called Mandelbrot.

Yes.

Who did fractal – sorry, geometry.

Yes.

Fractal geometry.

Yes.

And he was Professor of Mathematics at Paris University.

Yes.

And I said, 'Please, Professor, why did you move to IBM?'

Yes.

And he said, 'Administration.' I said, 'What do you mean?' He said, 'I have no administration here in IBM. I don't have to manage anybody. They just let me do what I want to do.'

That's… That… Yes. Yes. I… I… I've managed huge projects, but never people.

Right.

Right? Because, I think, the, the people side of things, before I joined IBM, I, I sort of started managing people, and I didn't enjoy it. And if you don't enjoy something, it's… You all… We all have to do things we don't like, OK?

Yes.

But if you… You don't want to do it as a career.

Yes.

And, I think, the, the, you know, the bottom line is that, you, you gravitate to what you like doing.

Yes.

Right? And, and then, it, I gravitated to various… I, I went from, you know, being a systems engineer, doing a bit of programming, and all that sort of stuff. And then, into big designing. Then into mainframes. And then, into consultancy and services and stuff like that. And I've been able to, just move like that.

[1:28:44]
I want to ask you about the future. And…

It's… It's very difficult to predict. [laughs]

It is very difficult to predict. But a prediction I will make is that, a lot of people are going to be, again, entranced by AI, artificial intelligence.

Yes.

And they are going to build systems. And this is my prediction. Tere is going to be an awful snafu in AI some time soonish, because people will rely on AI to do something, and they don't know what it's actually doing. You know complex systems, you've worked with complex systems.

Yes.

What do you think of the proposal, the suggestion, that I am making, that AI is going to really, blow up in some certain instances?

I… I think you're absolutely right, OK? I'll tell you about a book I've just written, which is… Anyway. The, the… If you look at, if you look at what the IT industry does, it, it has these what I'll call fashions. And, AI is a fashion at the moment, as is machine learning. When I were a lad, right, you started out, and, computers were there, and they gave management information. OK? And that was, information about what was going on in that part of the business. OK?

Management information systems, MIS.

Yes. Yes. Right. OK. And then, we come along, and then, the people are looking at that, and then, we, we got data warehouses, OK. Oh, that's, well, ooh wow, you know… So, you then get… [laughs] You looked at the data warehouses, and I work with several people on, with some data warehouses, so… But then you looked, and you said, 'Well, here are some tools, how do I analyse them?' Well, need four programmers in to do this, and 20… And, and these tools will do that. So we went round there. Then we went to big data. Right? And, has this affected business? Not really. No. OK? And when I was straying towards AI, as though, we've got learning systems, and that sort of stuff, OK?

Yes.

And, these systems are somehow, magically, going to have an insight into something.

Yes.

That's… Right. And I keep saying to people, it's still only programming. Right? In other words, what programming is, is a set of rules, that you put in there, right? Now you put those rules in there, and those rules actually go in and, do analysis, based

upon what you've said, not equal to. All that sort of stuff, right? And then, somehow, inside there, what artificial intelligence is, is more or less saying, is, I'm going to create some more rules in there. Right? And these rules are going to be new rules that you didn't think of, but I'm think- But, they're indirect rules, because of the rules you put in there in the first place.

Yes.

Right? There's the magnificent example of IBM playing Kasparov, the big bloke.

Yes.

So, 'Oh look at this. It's more intelligent than,' thing. What did IBM do? It put the rules of chess in.

Yes.

It… And, all the thing had was enough power to generate more moves than Kasparov could, could think ahead.

Yes.

[1:32:28]
Right? And so, the problem with artificial intelligence is, it's now, it's got, it's sort of got mixed in with robots, and all that sort of stuff that's coming along. And, and we clearly have robots, and that's it. But it's not… It's… I, I actually say, you either want intelligence, or you don't want intelligence. What you are saying is, oh, because it's artificial, it's different. But it… Most of it's still programming. Right?

How do we stop that catastrophe potentially happening?

Well, I think… I think, to a certain extent, it's sort of happening already. Let me tell you why. If you look at the Boeing MAX aeroplane, OK? A friend of mine, one of my drinking mates, he's a BA A380 pilot, OK. And I've talked to him about this a

bit, right? And it's quite clear that, twice, if not a lot more times, the pilots could not override the computer. Right? There was no way of doing this. And, clearly the fact, it's not just a software bug that's in there, else Boeing would have fixed that quite quickly. They're not stupid, Boeing. It's something which is, there, where they've got the whole thing wrong, and not thought the stuff out.
[1:34:13]
So, artificial intelligence, as it… And you know, the Government keeps spouting stuff about, the NHS and artificial intelligence and stuff. And you go, God, you know, these people are, are putting millions into, millions into this, and yet they don't actually understand what it is. Right?

Right.

There's been these attempts to do doctors' rules.

Yes.

And diagnose.

Yes.

Right?

Mm.

And you go, oh, yeah, OK.

I remember a story about one of the early, what were then called expert systems. Do you remember those?

Oh yes. Yes, yes, yes. Yeah.

And it was about nickel plating.

Yes.

And they followed this man, who was the great nickel plater.

Yes.

And they said, 'OK, now we can automate that.'

Yes.

And they automated. And the quality of nickel plating was dreadful.

Yes.

And they said, 'Look, well let's take him through it again.

Yes.

So he went through it again. And they said, 'Well, no, we, we've captured exactly what it does.' And then they saw him spit.

Yes.

Into the vat.

Yes.

And they said, 'Why did you do that?' 'Well I always spit into the vat.' He was a tobacco chewer.

Yes.

And, spit had a particular acid in it which made it work.

Yes.

You couldn't capture that.

No.

No, you couldn't capture that.

No. So, you know…

[1:35:22]
What's your book about? Your new book.

OK. The first book was about dynamic complexity.

Yes.

OK. The next book isn't like that. And I've written a… It's actually about… It's about, time and the universe.

Right.

But time doesn't exist in the universe. And it's something that's… I mean this is not, that new. It's something we've made up, out of the air, right. So… And you can… We've made it up. And, most mathematicians and physicists put time in their equations just to make things look, nice. Right?

Right.

OK? Now, what we're, what we are, we are doing though, and I, I, I don't know, but the second part of the book gets into, is the fact that, we have now supposedly got artificial intelligence. Now. And, the reason we can't get… Well, they're talking about going to Mars, but outside the solar system if you like, is because of our lifespans, OK, you see these programmes where everyone's frozen into… You know,

all that sort of stuff. But, we're not… Right. But now you think, you think, if I put a computer on, and computers are not that time-sensitive, right, and I've got artificial intelligence, I can take it out into space, and let it go on, until it reaches something. Time's not important. And you get out there, and your time is there, right? Now, if the artificial intelligence is good, et cetera et cetera, and this may be our mission given to us by what I've called the big programmer…

Mhm.

Right? [laughs] Who is… Right? OK? Then, it will export time out into the rest of the universe. OK? If it's bad, it will do what we're doing to the Earth, which is, what I've called digital pollution, right? [laughs] It will create chaos out there. And, if the universe is programmed, by the big programmer, and it is evolving in a series of steps, right, which are, like a program, say, and, artificial intelligence really is part of that, then that's good. If it isn't, it will bollox the program up, [laughs], right, like bugs, bollox every program we've ever written, right, and, that will be the end of something, right? So, that, that's roughly it in a nutshell.

[1:38:14]
Excellent. What's the biggest mistake you've made in your career?

Oh. I… I think I might say, possibly not stopping in the US, but that's, that's not… I, I often think about this. [pause] I… Maybe not going up the management tree in IBM, but I don't think I would have liked that.

Right.

Or… I am… [pause] I can tell you the best, some of the best… I'm going to have to, not use names here, OK?

Yes.

But, in about, six, seven years ago, there was a bid of £9.3 billion for the IT in the NHS.

Mhm.

Right? I don't know if you remember it.

Yes.

OK? It's still… [laughs] And, IBM was bidding for, at least three parts of that, OK, with big penalty clauses, all that sort of stuff. And, I was the IBM Fellow in Services. And the guy at that stage who was in charge of Services, we were actually in Germany for another reason. He got me in a room like this. We'd come out of a meeting which was, not on this, but a pretty bad one. [laughs] I shall never forget it. We went into this room in this, in this bank. [laughs] And, this girl came in, in Germany and she said… Call… He called me out, because we were having a break, right. And she said, 'Would you like a drink?' Like that. And I can always remember him saying, 'Yes. A really strong gin and tonic.' [both laugh] Anyway. And he, he said… He looked me in the eyes, and he said, 'Right,' he said, 'you are the chief technical guy we've got.' Right? 'Now then, is… You can only answer yes or no.' Right? 'Yes or no, and no flaking around. Is this NHS bid, is this NHS system going to work?' Right? 'Yes or no.' And I said to him, 'Mm.' He said, 'If you don't answer…' And… 'If you answer yes and it doesn't, I'm going to have a certain part of your anatomy,' [laughs] OK? So I thought, and I said, 'Is it going to work? Yes.' He said, 'Right. I'm going to get you if…' [laughing] So I said, 'In all honesty, you didn't ask the right question.' He said, 'Why not?' He said, 'What should I have asked then?' I said, '*When* is it going to work?' And he said, 'Well when is it going to work?' And I said, 'It's going to take three times as long as they think.' [laughs]

Right.

Got it?

OK.

And, we knew what the strategy was. OK? To…

It was an immense waste of…

Yes.

…of money.

Complete…

Great embarrassment all round.

Led by a complete and utter idiot. [laughs]

Yes.

Yeah. Anyway. So… Yeah. So, there are, there are some good decisions. I can't… I'm trying to think whether I've made any really, decisions that…

Maybe not staying in America.

OK.

[1:41:49]
Would we do better implementing complex systems if we used formal methods?

[hesitates] Ye- Yes. The problem is, we don't have… We've got all sorts of bits and pieces of formal methods, like project management, the design tools, some of them… Et cetera. What we don't have, I don't think, and there's a huge space here, we don't have the, the way… You wouldn't, you wouldn't design, architects don't design buildings without formal methods. You wouldn't design, Rolls Royce don't design the RB211 engine without formal methods, et cetera et cetera. IBM doesn't design… Or, Intel doesn't design the next chip without formal, formal methods that, won't try. But if you go in and you look, and you've got all, all these, ISO bids, and,

bits and dabs and, everybody has done this, and there are these tools to do that. And, basically, it, it's really interesting. But then, I step back, and I say, but look at the, the Internet. No one designed that by a formal method. OK? And you can say it was too big, et cetera. But the pieces… Unless you design something, it only works by, by sheer chance if the pieces aren't designed properly. And the Internet has, has worked very well. Et cetera et cetera. And these people, all sorts of people are imposing things on us.

[1:43:43]
Last question. Does the public sector have more disasters with complex systems implementation than the private sector? In your experience.

[pause] I don't have the figures for this. My, my feeling is, if you… The sort of question I got asked when I gave the BCS lecture, that's on the Internet if you want to look at it. The answer is, probably. Right? And, the reason I think it probably is, because, some government systems are so huge, that, like the NHS is huge, whatever, you know, the DWP is huge, because of the number of people, all that sort of stuff. So the answer is, as you get bigger and bigger systems, then the chances of them failing get higher and higher. OK? In other words, failure is, didn't deliver the function on time to budget. OK? So, you've got that. But then you, you've got the process by which the Government procures everything, and that's governed by, European law, and all sorts of other law. Right. And that says, you have to go through this incredible bidding cycle where you invite people to bid, hundreds of people come out, and then you go to a shortlist, then you go through… And by… It's a bit like gladiators in the arena. By the time someone wins it, they're absolutely knackered. [laughs] Right? They're, they're… They're… [laughs] Oh God. We've been bidding here for two years.

We've won it; now what do we do?

We've won it. [laughter] Yes, that's right. And the Government… And the people in the Government are probably knackered as well, right?

Mm.

So the process is flawed from the start, as opposed to… And also, the Government systems, you can't cover them up so easily. Whereas, in commercial, you can cover them up, unless you're a bank, and your systems fail, all that sort of stuff. So I, I would say, the answer is, yes, but… And, and you know, the Government are almost paranoid, well, because of the rulings about the cheapest type stuff. And they do these weighting factors that are, that are bizarre sometimes, you look at them. So, the answer is, I think they are, but, in defence of the people in the Government, they're, they're stacked against them. Right?

Thank you very much for your contribution to the Archives. It has hopefully been inspiring for other people, to tackle the continuing complexity, and to realise, I think this is part of your thing, there is no magic bullet.

The problem with complexity is complex. [laughs] Yes.

Thank you very much Maurice Perks.

OK, thank you.

[End of Interview]