Dr Timothy Walker

Interviewed by

Richard Sharpe

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Via Zoom

Welcome to the archives of Information Technology where we capture the past and inspire the future. It is Thursday the 25th of March, in the morning, and we are in Zoom land because we're in the third lockdown. I'm Richard Sharpe and I've been covering and researching the IT industry since the 1970s. Very often we have politicians and industry leaders grabbing the limelight, in fact hogging the limelight in the information technology history but for every 10 of these people there are one or two behind the scenes – just to carry on the theatrical aspect of it – behind the scenes were absolutely crucial to keeping this show running.

And the man making this contribution today, to the archives, is one of those people who you may not have heard of but who has been crucial to development and implementation of IT and also in administering and running sections of industry and science and technology, which have made big use of IT, and it is Dr Timothy Walker. You were born in Croydon in 1945 just after the end of the European War.

[00:01:20]
Yeah.

[00:01:21]
What were your parents doing at the time?

[00:01:23]
Well, erm, my mother had been a chemistry teacher, erm, she had been the only woman in the university in the 20s reading chemistry, erm, er, and my father had done a variety of things after the First World War but decided to become a – a Barrister in, in his 40s, and for that reason my mother kept her marriage a secret because women school teachers weren't allowed to be married, erm, and she helped him through matriculation and all that kind of stuff, and he was called to the bar the year before I was born. So, he was just starting to make a career as a Barrister when I was born.

[00:02:19]
And you were born when he was 46 so –

[00:02:23]

That's right.

[00:02:24]
So, your parents were considerably older than you were, well obviously older, but considerably older, erm, and what effect do you think that had on your family structure?

[00:02:36]
Erm, well my mother was, erm, er, over 40 when I was born, and I was the first. Well, I suppose one effect was that my, my father died when I was 12, erm, of a heart attack. I think – I had one sister who was, erm, just under 18 months younger than me. I think also the effect of the marriage having been a secret for about 10 years, erm, meant that I was a relatively isolated child.

[00:03:21]
Relatively isolated?

[00:03:23]
Yeah. I was sent off to school, to board school at eight. My father was determined that I would have the education that he'd never had, erm, because he was essentially an alternative dad, erm, and erm, er, and obviously I was going to do classics. So, that's what I started off doing and I – as one did in those days I started French at seven, Latin at eight, Greek at 10, you know.

[00:04:02]
What was primary school like?

[00:04:05]
Erm, well, I went to prep school at about eight. I enjoyed that. I played no sport at all, erm, before that so I had to learn cricket and football, and rugby, and what have you, and obviously I worked out quite quickly that I had to do all that if I was going to come top of the class, because people who came top of the class weren't very popular.

[00:04:45]

Did you enjoy sport?

[00:04:47]
Erm, yes, I did actually. I played for most of the school teams. I wasn't a natural sportsman but I was also a sprinter so I could run fast as well. So, erm, yes I did a fair amount, yes.

[00:05:04]
By going to a private school did you take 11+?

[00:05:07]
No. No. Erm, er, I erm, I was going to move at age 13, erm in fact my father died when I was 12 and my Godfather, who was also a person who had become a Barrister late in life, actually paid for my school fees of the rest of my time, and he said I should go to Tunbridge because he was a Skinner in one – and the Skinners were governors at Tunbridge. So, I was going to do that. I took a scholarship a year early to get some practice and I surprised everyone by actually getting one a year early.

So, erm, I was – there was no room for me in the school, erm, immediately so instead of going at the start of the school year I went at, erm, in January and scholars took what were then O levels in one year but I had to do it in two terms. So, I took, erm, I took my eight O levels in July and I passed them all, erm, and no-one really worried about marks in O levels then, but my scholarship was in maths and, erm, I – it was just after the Sputnik going up. So, I decided I would change to science.

[00:06:47]
Now, why was that pivot, why did you pivot like that away from classics into science?

[00:06:54]
I think, erm, er, two things; one, I got a scholarship in maths so I thought I might as well do maths, erm, and the second things was, erm, er, the Sputnik just having gone up, you know, a lot of boys, erm, you know, decided it was time to do science. In fact, quite a lot of the people in – who did Greek with me changed to doing science for A level.

[00:07:24]
And yet you have a – sorry.

[00:07:28]
So, I then, yeah, erm, having done no more than a term of science in my life I then switched over to doing, erm, essentially maths, physics, and chemistry, and erm, not much else.

[00:07:48]
So, where does your interest in seventeenth century history come from?

[00:07:52]
Oh, well that's probably from – that's post bridge farm. Erm, well I, erm, when I retired I decided I needed some projects to learn not to work and to learn not to be a Chief Executive and one of them was some local history and I wrote a book on local history and then I discovered there was a lot of people in the seventeenth century who lived roughly where I now live, erm, and who had been very influential in working under Cromwell.

And I did a history of that, and I then moved on and I'm now writing a biography of Nicholas Barbon who was the first property speculator in seventeenth century London, who was also a doctor. He wrote a thesis on malaria, that's all an interest I've got post retirement.

[00:08:51]
And what area of London is this?

[00:08:54]
It is Clapham. I actually live in, in Balham but it's – these people lived about a mile away from me in, in what is now – and what was then Clapham.

[00:09:11]

So, you got your three A levels with distinction in 1962. Physics, chemistry, and maths. And you applied to go to Oxbridge, Oxford.

[00:09:22]
Yeah, that's right. Erm, er, again, erm, er I was only 16 at the time. I did my A levels when I was 15. Erm, I did a scholarship a year early to get practice and, erm, to everyone's surprise I got one. Erm, er, um – the college was keen that I went up, erm, immediately but I didn't want to. I thought I was too young at just 17. So, I, erm, I said I wanted to take a year off and the college said because I'd only done two years of science I had to stay at school for one term of that year and so the physics master and the chemistry master basically went over the first year university syllabus with me.

[00:10:25]
What made you choose Brasenose College?

[00:10:27]
Well, erm, my chemistry teacher had been there and recommended it. I decided that because I hadn't been able to do further maths, because I'd only done one maths at O level – I got distracted on the chemistry and I enjoyed chemistry, and I thought I would do that, so I did.

[00:10:51]
So, this is a period '63 to '69, that you were in and around Oxford, what was the Oxford menu like for a student?

[00:11:02]
Well, I was the last of the pre revolutionaries. My contemporaries still wore jackets and cavalry twill trousers, erm, and I didn't object particularly to wearing gowns in, erm, in college. So, erm, and I then I took my finals in '65 and I then did a year's research, which was part of my – of a degree in chemistry, and I did that in spectroscopy and in theoretical chemistry, essentially going back to my maths. And then that was when I was first introduced to computers.

[00:11:51]
What was the first computer and what was it used for?

[00:11:54]
Well, the computer that I first used was one that was called a Mercury. It was still powered by valves, erm, er and, erm one had to – if I wanted any elaborate programme I had to write it in machine language because otherwise it would be too slow. Erm, and then during the time I was doing that research for my undergraduate degree Oxford got a new computer, a KDF9 and were absolutely thrilled because we had 64k or store.

[00:12:38]
Ferranti made the Mercury, didn't they?

[00:12:41]
Yes. ICL made the KDF9.

[00:12:46]
KDF9, yeah.

[00:12:49]
And so, I was writing in algorithms. Well, I started writing in auto code and then we wrote in Algol.

[00:12:55]
Did you enjoy programming?

[00:12:56]
Erm, up to a point, I mean it was a means to an end. I mean life was very different then. One – if one organised things properly one could get two runs of the computer a day. One got there early in the morning, one, erm, got one's error messages, one corrected them, and then one aimed to put it back and then if one did that quickly enough one would get another run in the afternoon when the morning runs had all been done. So, it was pretty slow work.

[00:13:36]
Obviously, a batch machine then.

[00:13:38]
Yes.

[00:13:39]
And you put them in a window, did you? Was there a window for submitting your codes?

[00:13:45]
No, I think we actually put them in a tray and the – the punch tape was then collected and, erm, some hours later it would come out in the – in another tray.

[00:14:00]
What were the applications you were using it for?

[00:14:03]
Well, erm, at that – in the undergraduate degree I'd written some programmes to analyse electronic spectroscopy a lot of these squares as it is on programmes. When I got on to my doctorate I, erm, I used some programmes that were only available on the IBM360 in Paris and, erm, my supervisor had money from NATO which paid for me to go to Paris to run those computers, and those were large scale ab initio calculations on small molecules. I didn't write the programmes, erm, they were – they'd been done by someone else, but I used them to do large scale calculations.

[00:15:01]
And you became a computer instructor?

[00:15:03]
Yes. Well, erm, they, erm – when I was a, erm, when I completed my doctorate and I got a fellowship the laboratory got a very small computer and I found myself, erm, as

one of the people who did more computing than most. I found myself instructing people how to write programmes and how to run them.

[00:15:30]
You left in '82 and you went to London Business School.

[00:15:38]
I, erm, what happened – after I got my doctorate I got a fellowship at, erm, at University College. I did two years there post doc teaching, I then went to the States for two years, erm, doing more research and teaching using computers as well. Then I decided universities were going to have a hard time and I thought, erm, I would do something different, and erm, after a couple of years at the GLC I joined the civil service.

[00:16:19]
What was the computing scene in America compared with the computing scene in the UK?

[00:16:27]
Well, erm, more American, erm – most American universities had quite big IBMs and certainly the ones when I was there, so I then learnt to programme in Fortran although I'd done a bit of that in Paris, erm, er and again it was still batch processing and it was still, you know, two runs a day if you – occasionally three if you really got your skates on or chatted up the operators, er, yeah, it was quite possible to do but it was quite, erm, slow and laborious because of course, erm, the programme stopped at the first error so you didn't find out about the second error until you ran the programme again.

But it meant that I got quite a good basis in programming in high level languages. Of course, none of that has been any use for modern computers, er, erm, it meant that I had some basic understanding of what they did and how they could be used.

[00:17:49]
You have a favourite programming language, or did you?

[00:17:51]
Erm, I think I probably preferred Algol to Fortran but actually, erm, if, you know, you used the language that the computer used, er, used so erm, when I was using IBMs I wrote in Fortran and when I was on ICL computers I wrote in Algol.

[00:18:20]
Then you seemed to make a very quick turn and you joined the GLC.

[00:18:27]
I joined the GLC, erm, er – I then – my first wife died, and I stayed on for a bit, and I then decided to join the civil service and I applied to join in my – it would have been my early 30s.

[00:18:51]
So, why that move?

[00:18:54]
Well, when I was working in the GLC it was clear that most decisions were taken in central government, not local government, so I didn't see any attraction or – and I thought also I would be more – having worked on housing matters in the GLC I thought I would be more interested to work on economic and maybe on scientific issues, erm, which is why I joined what was then the Department of Trade and Industry.

[00:19:27]
In 1980?

[00:19:29]
No, I joined in 1977.

[00:19:35]
'77, okay. So, what was your first role there?

[00:19:38]

My first job was dealing with trade with the Middle East and, er, it was interesting. I was able to travel. I went to my portfolio companies in the Middle East, which is essentially involving that – what would have been called an advance on Lebanon, Syria, Jordan, Israel, erm, and then after that I moved to dealing with the Post Office and I worked on splitting the post office and creating British Telecom as a new Tory nationalised industry, and that was leading up to the privatisation.

So, I also worked on the – at the beginning of, erm, of, of erm, liberalising telecommunications. I was present at the first meeting between Mercury and British Telecom about breaking the telecoms monopoly.

[00:20:46]
Mercury was this, erm, I would call it a faux competitor which was established as if there was real competition to BT, wasn't it?

[00:20:55]
That's right. Yes.

[00:20:56]
Cable and Tele – Cable and Wireless –

[00:20:59]
Cable and Wireless then bought it I think, or Cable and Wireless were a shareholder, I forget exactly.

[00:21:04]
And Barclays Bank, wasn't it?

[00:21:06]
Yeah.

[00:21:09]
And they put – just to show they were around, they put erm, telephone cubicles, didn't they, in the City of London just to show they really were there.

[00:21:20]
That's right. That's right, yes.

[00:21:24]
Do you have a political background, did you have a political view of the privatisation of BT?

[00:21:31]
I mean my view – I had in my civil service career I had quite a lot of interaction with a number of nationalised industries and I saw them as extremely bureaucratic, er, and completely, um, er messed around by government and political decisions. So, I saw privatisation as a good thing operationally and managerially.

[00:22:05]
And it did work didn't it, the float did work. BT was indeed privatised.

[00:22:10]
It was, yes. It was, yes.

[00:22:13]
And it became, apart from AT&T in the United States, and particularly within the mew of telecoms companies and carriers in Europe very distinct from them. These were all state owned. France Telecom, Deutsche Telecom, etc. but here was BT now a privatised company. Difficult relationships.

[00:22:34]
Yes, I moved on from that by then. Essentially the bill that I put through Parliament that created a British Telecom on started some stuff on the telecoms liberalisation. I then moved on to something else. I then moved on to industry and I was involved in things like bringing Nissan to the UK, and a number of other negotiations like that, and then after that I was sent to a Business School for a year.

[00:23:10]

Right, now, why didn't BT make itself into a big international carrier?

[00:23:17]
Well, I'm afraid I wasn't involved with them at that time. I can't remember. There will be other people who will be better placed to answer that. I mean we are talking about 30 years ago.

[00:23:36]
We are, we are indeed, yeah. You went to London Business School, '82-'83, and erm, because you'd recognised the importance of human factors in management. What type of a manager are you?

[00:23:51]
Well, er, it's – I mean I think what I found – I realised then was the importance of being able to motivate people and being able to deal with people on a one to one basis, and one couldn't be distant. So, I would like to think of myself of an enabling manager while giving an overall direction, I'm encouraging people to work out what they should do themselves and support them in those decisions.

[00:24:31]
You tend to persuade people?

[00:24:38]
That is my intent. It isn't always successful. I mean in later – my later career I tended to move more into managing large numbers of people rather than dealing only with politicians, and so actually I was in – number two in customs which had about, erm, 30,000 staff. Immigration had about 5,000, erm, and health and safety executive had about 4,000, and so then I was interested in kind of – how do you not just manage to lead very large numbers of people.

[00:25:22]
How do you do that?

[00:25:23]

Well, you've got to give them a vision that they can identify with and spend time talking to them about it, er, and you've got to be visible, erm, and, and make sure you, you interact with all levels of the organisation. You can't just manage the top tier.

[00:25:51]
Then you came back to the Department of Trade and Industry, as I think it was then, and erm, kicking around about that time was the idea that there should be a programme for fifth generation computing, and the Japanese had just launched one and a number of people went to Japan, er, including your ultimate boss as a civil servant, Ray Atkinson. And people from industry.

[00:26:20]
I never worked for Ray actually, but yes.

[00:26:26]
And erm, they basically came back, and they put together a programme called the Alvey Programme. Now, there has been criticism of what this was about. Japan launched their programme because they considered themselves to be poor in research full stop whereas this is Ian Barron's analysis of Alvey; "This is the last thing the UK was pouring, it had tonnes of research, but it couldn't make money out of things". So, actually Alvey was faced in the wrong direction. How do you respond to that criticism?

[00:27:08]
Well, I think that – we all know the kind of – you spend a pound on research, £20 on translating it and £100 on the development. I think that I would say that the – one of the crucial problems with the UK then was that industry and universities did not work together and did not interact very strongly. I mean when I did chemistry at Oxford we never did anything about industrial chemistry, ever. Not that I remember. There are arguments for that but the fact that we didn't – and erm, and actually very, very few of my contemporaries went into industry.

Actually, those who did tended to go into the computer industry, erm, er, and so I think although it was a fundamental problem about industry looking down – industry

thinking that universities were irrelevant and universities thinking that erm, industry wasn't very interested in or capable of research. And so, I think, and this isn't just hindsight, I think that achievement of Alvey was to get, erm, was to lay the ground fall, because it didn't happen overnight, more cooperation between industry and universities.

[00:28:56]
Some conspiracy theorists say that the whole project and idea of the fifth generation, which was partially Japanese driven, was really just to attack IBM and that was one of the objects, do you agree with that?

[00:29:16]
Erm, no, I wouldn't say – obviously, the UK was putting a lot of effort into promoting open systems which, you know, might be regarded as a threat to IBM. Erm, I think that, you know, there were – I mean don't forget one of the other elements of Alvey was the Ministry of Defence research was also associated with it, and that too was a major change, both linking, erm, er, university research with MOD research, and linking more closely, erm defence research with industry as well.

So, bringing all those together. I mean I would not say that Alvey changed things in its lifetime, erm, you know, irreversibly but actually that's what happened and when I think of the cooperation there is between, erm, universities and industry now – you see that in Covid, for example, that my old research group in Oxford, erm, have created a company called Molecular Electronics that went up to half a billion worth before it broke up.

That would never have happened before Alvey, and so I think that the lasting – I mean I don't know what, erm, whether great research came out of Alvey or not, but I think it did set a new tone for a cooperation that over the last 20 or 30 years has been developed and taken forward, and I think that has been extremely fruitful for the UK, and I think the effects have spread wider than the IT industry. As I said, you know, the working between universities and being thorough on vaccines is one example of that.

[00:31:37]
And in this period when it was set up, '82-'83 and so on, actual real computing is going in a very different direction. We've got some microsystems founded using Unix and work stations. We've got relational databases coming out. We've got Lotus 1, 2, 3 overtaking [s/l Vizicap 00:31:59]. This is really the direction, is it not, of computing. It's nothing to do with really this fifth generation into which we poured – well, £250m was it and the Japanese a lot more?

[00:32:15]
Well, I think you shouldn't forget all the stuff that came out of, erm, Stamford on the interaction between man and machines, I mean essentially all the stuff about the mouse, clicking, how it has structured screens in such a way that people would interact with them better, that's actually fundamental to what's going on now in computing, isn't it. That was going on at the time and, erm, Alvey did have an element of that.

[00:32:56]
You attribute that not to Xerox but to Stamford?

[00:33:04]
It was all going on in the same place wasn't it. I mean I'm not going to go for the scaffold as to who did most of it, but it was going on there, and so on.

[00:33:21]
That's partly my point. It was going on there and was not going on here.

[00:33:26]
Well, as I said something was going on here. There was a man machine interface, work going on.

[00:33:42]
There was an evaluation of the Alvey Programme, an interim report in valuation published in 1987, erm, when you went back to the Alvey Programme and, erm, it's written as a conjunction between those who criticise it and the Alvey Programme

itself and in, erm, in civil service language I read it as very damning of the Alvey. Do you?

[00:34:15]
Erm, I didn't think in those terms. As I said I think the idea that after two or three years there would be world breaking science that would create billion pound companies was naïve and obviously if that's what you thought it was for then you say it didn't do that. My view, as I said to you before, is the benefit of Alvey, and indeed of European programme, ESTRY, which Alvey helped us get a very large part of. We got much more than our fair share of that because of the basis that we had in Alvey.

The long term effects of Alvey, which would not have been apparent when it was still going on, was the long term effects of getting university and industry to work together. I think that's a long term benefit. I don't think, as I remember, that evaluation really addressed that issue at all because it was too soon for it to say.

[00:35:33]
But this report, interim report, criticises the internal functioning of Alvey. It says some areas didn't have enough staff to cope. There were poor interfaces between – the interfaces between the DTI, MOD and the SERC, there was a lack of deadline system for proposals. There was a lack of administrative procedures and management.

[00:35:58]
Well, I think there's always, erm, I don't know how many research programmes you've run but every research programme I've ever been associated with, erm, the people wanting to do the work have just wanted to get on with it regardless and, erm, they can pay back. I come back to the fact that this was the first time there have been serious cooperation between industry and university, and between those in MOD.

No-one knew how to do that. Everyone had their own views on it. Making it happen was actually quite difficult and it is because of all the investment in the aggro that took place that over time people learnt how to do it, and that was the problem. I mean a universities didn't like having any targets, you know, they didn't think that was right

for them. Erm, we had to proceed by – we had far more applications than we could possibly fund, and it took time to sort them out.

I think it was not a perfect arrangement, erm, as I said I come back to the long term benefit of Alvey was getting industry and the academic world to work together. That development over 30 years I think was worth a lot of money. The fact that we've got it now, it took longer than I would have liked, erm, er, one of the things about cooperation is you then get everything you want.

[00:37:56]
You then moved to the head of atomic energy division. This was a classic civil service process of you being an expert, not in that area, but having to become an expert in that area to actually run it. So, you must learn very quickly.

[00:38:16]
Well, you say that, but I mean, erm, I had written about 35 papers and published them in – on physics journals. I did actually understand nuclear physics, and when I met Lord Marshall who thought all civil servants were ignorant I said to him "You do realise don't you not only do I have a doctorate in essentially theoretical physics, but I've given invited lectures at Los Alamos, Obridge and Algol, and his jaw dropped. So, erm, you know the first thing you could say I did have quite a lot of background.

The second thing was my first task was to create – was to take the nuclear industry out of the possession of privatisation and create a new Tory nationalised industry. Well, who was the last person who did that. Answer, me, with British Telecom. So, actually, erm, you know you can, er, it's, erm – I did have quite a lot of expertise in quite a lot of the things. I'd also worked on a number of privatisations. When I was the Minister's Private Secretary I worked on British Airways, Cable & Wireless, erm, and steel privatisations. So, actually, erm, I would reject the idea I knew nothing about any of it.

[00:40:06]
I understand. I withdraw the question or the implication of the question. So, nuclear industry was taken out and created as a separate process, yes?

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Yeah.

[00:40:18]
And it had to be because of economics.

[00:40:21]
Well, erm, Marshall was very keen to protect the nuke industry and he talked up the liabilities, erm, in the expectation that the government would bail them out, and he talked about it so successfully that the government said, "We're not going to". So, it was a fundamental negotiating error on his part, and of course in due course, erm, nuclear electric as it was then – it became British Nuclear, was indeed privatised.

[00:41:05]
And you secured the building of Sizewell B to expand production, yes?

[00:41:12]
Well, that was the first PWR reactor built in the UK and the last so far, although there are now – there was – EDF are building the European model at Hinckley, and there may be others yet, we don't know.

[00:41:36]
Why then is the nuclear industry, at the moment, seemingly in such trouble?

[00:41:41]
Well, I think it was obviously hit hard by Chernobyl. It was obviously hit hard by Fukushima as well. Erm, but the essential thing is that nuclear – nuclear has very high advance capital investment, erm, and then very high running costs, and the capital markets find that very difficult to fund, and there are also continuing to be issues about what one does with nuclear waste.

[00:42:24]

Indeed, there was talk on the early days after Windscale was opened up of free electricity, wasn't there?

[00:42:30]
Yes, well I mean the running costs in nuclear are extremely small, but the upfront capital investment is extremely high, and erm, how you remunerate the capital for that, that's always been the big issue about nuclear capacity. Now, you can do it where there's a monopoly because essentially the monopoly supports it. It's more difficult to do in a competitive environment and you also have the issue that nuclear is more appropriate to baseload because you don't really want to keep turning it on and off.

That is one of the issues about the grid now, you're going to need some baseload because you can't – because the sun doesn't shine, the wind doesn't blow 24 hours a day, seven days a week and so you have to have some baseload, and you have to be able to remunerate that.

[00:43:37]
And it better not be coal.

[00:43:40]
Well, that's the disadvantages of coal. I mean all energy production is dangerous and all energy production pollutes, the question is how do you manage that.

[00:43:55]
And you need a lot of computing as well in nuclear energy, do you not?

[00:43:59]
Erm, well obviously there are very extensive computer controls, and you have to have the systems for being able to control those, and to judge whether the controls will work. So, obviously in my background in computing, erm, it was relevant to the regulation of nuclear safety and when I was at the Department of Energy I had overall responsibility over nuclear safety, which I also had when I went to the health and safety executive.

[00:44:39]
Did that frighten you? That was a big responsibility.

[00:44:43]
Yeah, erm, but you know, there was – there are very extensive ways for dealing with it, erm, and one of the, erm, and ways of managing and mitigating the risk, particularly by, erm, making things run in such a way that you didn't have to take decisions in 20 seconds. You had some time to think, and all the designs had to be created in order to make sure that people were not going to have to take instant decisions about what to do about nuclear power, erm, when something appeared to be going wrong.

What a lot of people don't realise is there are lots of ways of managing human error, erm, and there's always going to be human error. So, you have to find ways of managing. The example I always use for that is when ATMs first were developed people thought that – the first people would want to get out of the machine was the money. And the of course what happened was that they forget to take the card. Well, you can manage that error very simply by making people take the card before they take the money.

Now, that's just a simple, you know, the way you order operations, remove the possibility of a kind of error. Well, that's the kind of thing that is used and is still used in the nuclear industry. And of course, in the chemical industry and all the process industries. It's, erm, you know, managing human error, and that actually goes back to quite a lot of the man machine interface stuff. I mean there's a lot of work done on what colour screens they should be.

What is easier for people to recognise, one colour or another, that all goes back to if you like the fifth generation programme work, then it was done all over the world including in Alvey, but it took a long time to get to fruition.

[00:47:05]

It's a very good example, about the card and the money, it's an extremely good example. You moved to the Home Office in '95, immigration the EU Affairs, and you were there three years. Now, during that period we've got a beginning rumbling in the background and coming forward, and being talked about an awful lot, is the Y2K problem. What is your view because we have done some research into the great span of people who've made their contributions to the archives, and on the one hand we have some people saying it was a con.

It was a very, very clever con by the consultants, and on the other hand we've got people saying we did very well as an industry because we avoided an enormous crash. Do you have a view?

[00:47:58]
Well, yeah, of course. I was also involved in Y2K at customs as well, and customs had a lot more computing than – I mean the fact is the people who say it was a con, erm, forget that actually people didn't know whether there was a problem or not. And if you're dealing with either life threatening or revenue threatening situations you can't say well, you know, it's okay. In the event on – I'm not sure if there was anything that would have caused a big problem. I'm sure there were small issues that were cleared up.

But I don't think anyone knows, I don't know, whether there was a big issue that was saved, but the fact is at the time people did not know and so when you don't know you had to take some steps to deal with it.

[00:49:17]
And therefore, one argument is, and it was dealt with very successfully.

[00:49:22]
Well, I think that, you know, that's – whether it could have been dealt with quicker or cheaper I don't know, but the fact is as far as I'm aware no major system had a problem.

[00:49:37]

And how was your blood pressure on a couple of minutes towards midnight on that evening?

[00:49:43]
I was confident. You know, the big systems had all been checked. Now, it might well be that, you know, erm, you know, something I'd done with my home computer had a problem, I don't know, but the fact that there were no big problems seems to me that it was a success. Now, that doesn't mean that it was necessary because again we don't know.

[00:50:20]
Who did you use to do that work in customs?

[00:50:26]
I honestly don't remember, erm, I'm afraid I don't remember. Some of the things were done by – I mean customs had some quite good IT people as did the Inland Revenue, because I was also on the Board in the Inland Revenue. The Inland Revenue, erm, some initials beginning with E, I can't remember what it was, erm –

[00:50:57]
EDS?

[00:50:57]
Yeah, EDS. They used EDS but I do not, I mean everyone found some little bits that could benefit from tidying. What I don't know was whether, erm, a major problem was averted but the fact is one didn't know if there was going to be one and we can't just say well we'll just wait and see.

[00:51:28]
Given the complexity of computer systems why or is there not, it seems to me when you have public bodies and large scale computer system projects this often leads to large scale disaster.

[00:51:46]

Yeah, I think that's right. There are plenty of large scale disasters in private companies as well. I think on the whole the government tends to have more complicated systems and the tendency is to try to do too much too quickly. Erm, and actually, erm, you will get, erm, er better results if you do it relatively small projects but the difficulty is the projects all have to be inter-related and if you do small projects one at a time then you find the project you do first isn't quite right for the project you do last.

And so, you know, it is extremely difficult, erm, but I think that, erm, the major problem is that the scale of government computing is extremely large, the complexity is extremely large, and erm, the accountability is although not always completely transparent is a lot more transparent than in the private industry. I think that the large scale computer, erm, systems are a problem full stop.

[00:53:24]
That's probably true of patient records in the NHS but is it really true of Horizon in the Post Office, a relatively simple application and it has been dreadful, the tragedy on people's lives –

[00:53:39]
I agree that's, that's been awful, I don't know why the problems happen there.

[00:53:52]
Would you advise young people to enter the industry and if so where?

[00:54:00]
Well, I think that erm, it depends on what they're interested in, erm. There will be some people who actually like coding, and if they like coding there are things that they can do. There are other people who like working on systems and again, you know, there are things for them to do. I think to some extent you've got to decide whether you want to be a provider or customer because I think those are different skills. Obviously, you can move from one to the other.

It also depends on what you call the industry. I mean the gaming industry is an extremely successful one and actually one that the British are very good at. If you were a big games enthusiast why not join the gaming industry. So, I see no reason why people shouldn't join but I think it depends on what, erm, what their interested in. I mean for myself I think that the big – the really big industrial issues are likely to evolve biology over the next 20-30 years.

There will be lots of computing in biology as well and I would personally encourage people to go into, erm, biology, mathematical biology, physical biology, and the computing that that needs.

[00:55:48]
Now, you must have made mistakes in your career, what were the big ones and what did you learn from them?

[00:55:56]
Erm, that's always a difficult to one to answer, erm – [pause] – I think there was some, well there were some issues about introducing computing into immigration which on the one hand is the bureaucratic rule based systems. In theory it should be easy to do but firstly they are incredibly complicated, erm, and I think that we didn't get that cracked. I think that is what underpins my view that, erm, you have to be very wary about creating big computer systems.

It is probably better while operating as far as you can in an open systems, environment, so the individual bits would be able to talk to each other, to do it in relatively small bits at a time, the problem about immigration is every bit interacts with every other bit. And so, it's quite hard to separate out and then you also have to recognise that, erm, getting staff who have never used computers before to a state where they can use them, I don't think that – in my case one is talking about 25 years ago.

Erm, it was really quite difficult. That was – people were used to emails but not much more. And so, I think you've got to also reckon about the pace of change. I think that, you know, how do you introduce big computer systems into very complex

environments, erm, and how you make sure the staff are able to deal with them is the big issue.

[00:58:57]
And indeed, just recently there seems to be a growing concern about decisions being made automatically, that the algorithm determines the outcome. For instance, over the ratings of exams last year, and over immigration applications now.

[00:59:19]
Well, my view of the education, I think that algorithms got a bad, erm, name because of that. I mean the algorithm was crazy. So, it wasn't the algorithm, it was constraints that people put into it. What they said was the – if a school got 3 As, 2 Bs, a C and a fail last year, it had to have the same proportion this year, now that's now the fault of the algorithm, that's just a stupid thing to put into it. So, I think that erm, the – although there are some things where algorithms are perfectly sensible.

Erm, but you've got to make sure you understand that you have, you know, the traditional phrase garbage in, garbage out. So, why not post an algorithm – a decision making in principle, but I think you do have to understand, erm, what has gone into it. The assumptions that have gone into it, and how it works. My background in theoretical physics makes me distrust big models because my experience is that big models start to require lots and lots of data that people don't actually have, and they guess that.

And that's actually been quite a lot of the problems about the projections on Covid, they're big models with lots of data, much of which is pretty bogus because the data doesn't exist, and so I think that's another take I have on algorithmic decision taking, if the data that underpins either known or knowable.

[01:01:30]
Now that you're retired what do you miss of your career?

[01:01:36]

Erm, well actually to be honest I've always been a person who moves on, erm, I mean one of the things I don't miss is HR, er, I was very pleased to have done it, I enjoyed it, when I left I didn't spend three years wishing I was still doing it. I certainly don't now.

[01:02:08]
You spent some of your time collecting African art, which I see on the windowsill of your room.

[01:02:13]
Yeah, you can see some in the room, yes.

[01:02:15]
You really enjoy that?

[01:02:15]
Yeah, I enjoy that. I mean I have been to – I went to Africa when I was in charge of immigration for obvious reasons. I've been to East Africa, I've been to Mali, I've been to Ethiopia but a lot of the art I actually buy in London, you know, or in Paris. I enjoy doing that. I have a lot of other art in the house. I've always bought a lot of art, nothing madly expensive but, erm, I enjoy having it and I enjoy the – what you can't do in a museum, you can pick it up and touch it, or put it somewhere else, and change the life of it, and so on.

[01:03:09]
Your very own collection. Well, thank you very, very much for your fascinating contribution to the archives. It was a collection of great memories. Thank you very much Dr Timothy Walker.

[Audio ends: 01:03:19]