The Past and Future of Australian Innovations in Information and Communication Technology (ICT)

Oral History Interview

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Neville Roach

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Project Summary

This interview is part of a series of oral history interviews undertaken by the Pearcey Foundation and the University of Sydney as part of the project 'The Past and Future of Australian Innovations in Information and Communication Technology (ICT)'. The series interviewed recipients admitted into the Pearcey Hall of Fame from 2003 to 2020. The hall of fame recognizes outstanding life-time contribution to ICT in Australia in business, research and government. Each oral history captures a short biography of individuals who made an outstanding contribution to ICT in Australia. They also collect insights on aspects that had a lasting effect on ICT innovations in Australia, positive as well as negative from approximately the 1960s to the 2010s. Interviews lasted about 60-90 minutes and were conducted by Sebastian Boell, Graeme Philipson, Peter Thorne, Kai Riemer, Sandra Peter and Belinda Wang. The complete set of interviews in this series is archived by the Pearcey Foundation.

Key Points Covered in this Oral History

1. PDP brought benefits for national innovations, such as nurturing some research centres and projects (e.g. WIFI), and it is more effective than the Offset program in terms of MNEs' obligations to local innovations(e.g. FAST); however, such a beneficial program was wound up due to being against to free-trading notion.
2. The government has not exercised its power at full potential regarding promoting innovation, such as the cut of PDP, the cut of funding for university research, and the closing down of NICTA (Though it is turn out to be Data 61 as part of CSIRO, the independence it brought makes it a less invisible government initiative before the acquisition).
3. An attractive immigration policy is another good way to obtain global talents for local innovations.
4. The remote location (tranny of distance) to major markets hindered the local business growth globally. In response, Australia should keep good connections to Asian powerhouses, such as China and India. And local start-ups should have foresight for global thinking (e.g. Atlassian).
5. The IT landscape has now changed with a start-up culture, and the industry association (AIIA and ACS) should adapt to the diverse nature of the current IT landscape, to enable its active role in connecting the fragmented and rich parts into a whole.

Biography

Neville Roach AO

Former Chairman and CEO of Fujitsu
Pearcey Medal in 2008
Pearcey Hall of Fame in 2008

Executive, Social policy advisor, Honoris Causa

Mr Roach is a distinguished Australian who has made major contributions to the ICT industry, Education and Research as well as developing Australia's multi-cultural society. Born in India, Mr Roach moved to Australia in 1961 and concluded his business career as Chairman of Fujitsu Limited. He was active on numerous State and Federal Government ICT related advisory groups, was an office holder in the Australian Information Industry Association and is a Fellow of the Australian Computer Society.

He is also a Doctor of Science (Honoris Causa) of the University of New South Wales (UNSW) and a Fellow of the Australian Computer Society.

He worked for IBM from 1965 to 1980 and Fujitsu from 1980 to 2004, serving as CEO and Chairman of Fujitsu Australia and New Zealand from 1989 to 2000. He is currently Chairman of FNS Pty Ltd and TCSM Pty Ltd, both subsidiaries of TCS and of Collaborative Services Network Pty Ltd.

His work, R&D and education is broad based perhaps best illustrated in his role as founding Chairman of National ICT Australia, the nation's premier ICT research group. His sustained contribution to the development of national policies on social and cultural issues is exemplified through his chairmanship of the Business Migration Advisory Panel.

Interview Transcript

Date of interview: Monday 05 October 2020

Can you summarise your career, how did you get into IT, how did you come to Australia, what was your background?

So my background is really not in IT at all, it was, I had an Honours Degree in Economics and Political Science from the University of Bombay, now Mumbai, and I joined a company called the New India Insurance Company which was part of the Tata group which had something, a scheme called Apprentice Officers Scheme. I joined that. The minimum qualifications was an Honours graduate. I managed to top that particular batch and so got what was regarded as a new and somewhat brazen appointment to come, to transfer to the Australian operations which…

What year did these things…?

In 1961 I came to Australia.

Oh right, a long time ago.

On what was then a four-year business visa, that was the only thing I was interested in getting, there was no prospect of migration. Australia had a White-Australia Policy and that was the way it was, and one just assumed that would never change, so I came on my four-year business visa, I ended up then having some strong differences of opinion with the company on some personal treatment, and then decided to quit, a very high-risk thing to do because I couldn't stay here, I was employed, in the only industry I was familiar with was general insurance. I was employed by India's unquestionably largest and best insurance company, so returning back to India and then working for second best was not an appealing position. But then I went into problem solving mode and I came up with creative solutions to that particular problem. I decided I should learn something new before I went back so that I could change careers if I needed to, which I expected that I would need to, and computing had only just, as a subject at universities had only just begun. So, Adelaide University had started a Graduate Diploma in Computing Science, they accepted my degree as being sufficient to do that course, and so I enrolled in that course, but I still had no extension to my visa to even know that I could actually complete that course. So I decided then to look around for jobs, was approached by both ICL and IBM, I was accepted by both ICL and IBM, IBM seemed the preferable one, but their problem was that the Adelaide manager who gave me the job said "I can give you a job, you've done very well in the aptitude tests, you've got a good background, but if you can only live here until you complete the course, and that's hardly good business for me and for the South Australian branch", which was reasonable. So I then had this brainwave and I said to him "So how long do you think I need to be able to stay"? Because that was all he wanted that I should be able to stay, there was no bond or commitment, and he said "Well, actually, I think seven years", interestingly that's the same period that the New India had, which was two years to train on a fully-paid basis, and then five years to recover the investment, that was how they saw it at that time. So anyway, I said will you give me a job offer with that condition, which he did. The benefit of being in Adelaide, small place, and the White-Australia Policy was that Gladys and I, my wife, we were kind of, celebrity would be too strong a word but we were certainly much better known than anyone as young and relatively, not very high up in terms of income or stature or just in terms of knowing people, but because we were a kind of rarity we ended up being involved in a lot of things. Because, just as a passing example, I was, used to be, I joined the Apex Club, became the International Director because the international flavour that I brought to that was significant, and I'd be invited to join panels, and in the course of those panels on international subjects would have seriously important people, by Adelaide standards, senators, the Attorney General once, and so on, and so I began mixing in those circles through those connections, and so I was, through that I was able to get a connection with Senator Laught who took up my case and lo and behold, Hubert Opperman, you might remember "Oppy" or know of "Oppy". He actually agreed to a seven-year temporary visa. Subsequently I worked in immigration as an advisor, they assured me that no-one has ever got a seven-year temporary visa. Having got that visa and then the policy changed a couple of years later by Harold Holt and Hubert Opperman, and it suddenly became possible for skilled people to actually stay on in Australia to start with if they were already here, and on that basis I was given permanent residence. And then we just lived on, and so I just knew ease of life in Australia, a seven-year visa, and a job with IBM, which at that time as you would know was

absolutely the world's dominant IT company, and that worked very well for me, I worked for them for close to 15 years, and then…

What position did you end up with at IBM and how did you get into Fujitsu?

And then I again, what happened was there was a grievance that I had, there was an issue about a position that I'd been promised by the CEO which I had earned but the person administering it found some technical reason why I wasn't eligible for that position. I used the IBM open door policy to argue the case, was able to meet the CEO and CFO and the HR Director and they went through the process as IBM always did, with courtesy and seriousness, but in the end they didn't approve that payment. That really upset me quite significantly and I started looking around, and as it turned out of course, Fujitsu was very much in the news, was the dominant IT company in the news at the time…

What year are we now, Neville?

So, now we're in 1980, so that was the year, but certainly during that year the famous IBM, Australian Bureau of Statistics incident took place.

Yes, we all know about that one.

That was absolutely fascinating, but I was still at IBM, and the secretary to the branch manager brought in a radio and said we could listen to Parliament, and of course everyone on both sides of politics was blaming the other side of being in IBM's pocket, and Fujitsu of course was getting all this favourable publicity because it was the hero that had, you know the whole history of giant killers, how giant killers come, Honeywell, CDC, and then it was Fujitsu, so anyway, they offered me a job as national system engineering manager.

What was your position at IBM when you left?

I was at the second level in terms of system engineering management, it was divided into two regions, northern and southern, so I was responsible for southern, which was Victoria, South Australia, and Western Australia, and…

Fujitsu was getting, a very high proportion of its staff were ex-IBM in those days, were they not?

In that time it was generally ex-IBM or from IBM customers. Because at the time IBM was fairly reluctant to recruit people from customers, and understandably so. They were smart marketing people. So if customers wanted to join the IT industry, Fujitsu, which had comparable hardware and software, which was quite unique of course, and that's where we drew our resources from. So the number of ex-IBM people that joined Fujitsu was not high, it was not high, yeah.

So you joined at a very senior level, you said as national systems engineering…?

Manager, yeah.

Yeah.

So yeah, but it was in a very high-growth phase when I started, I think we might have had 30 or 40 systems engineers reporting to me…

Was George Ranucci…?
Well that happened later, so Mike Rydon…

Mike Rydon …
Well there was a separation, let us say, of the then Sales Director, fairly well-known identity in the industry, by the name of John Linton, I don't know if you remember that name.

Yes, yes.
But he was and there was a separation with him, and Mike Rydon, then George Ranucci, was still at IBM or he had just left IBM, but he recruited George to come in as Director of Marketing and then that my role was put in under George, whereas previously I was reporting directly to Mike Rydon. But George himself did not stay very long, he stayed for three years and a bit, I think, and then I was selected by Mike Rydon and more, and probably more significantly by Fujitsu in Japan to become the CEO. So I worked under George as General Manager of marketing which included systems engineering, and then he left.

So what year did you become CEO?
In 1989.

'89, right, and Mike Rydon was what, a chairman or still involved?
No, he wasn't, he completely retired and…

So you were then CEO from '89 until, for quite a while?
Till when, sorry?
Well I was CEO from '89 to 2000, and then I had become in the meantime chairman as well as CEO, Fujitsu decided that external directors were struggling with appreciating the differences between the way Japanese executives saw issues and matters and their decision making processes, and we had a fairly aggressive, a few aggressive directors who for whatever reason, there was a bit of tension, so the eventually decided not to continue as a public, with a public external board, but to in fact have an in-house board, and so I became chairman and CEO.

Yeah, now what have you, what's been your career post Fujitsu briefly?
Post Fujitsu, well it started while I was still at Fujitsu, my career sort of branched out quite strongly into a whole range of government appointed committees and boards, that became, in fact when I look back on a number of appointments I had, I have to ask the question as to whether it was possible to do justice to all of them, I like to think I did but so I became deputy chairman of SBS, I became chairman of NICTA, which we should talk about of course in the context of R&D, chairman of TAFE Global, chairman of the Smart Internet, followed by the Smart Services Research Committee, and also eventually became a Director of One Steel, when it was floated out of BHP, and that was a top 50 board at the time, which was again, quite a significant thing, because no-one from Asia, I think. had at that time been appointed.

And Neville, do you have a CV or a document outlining the dates and positions?
Yeah, no I can send you that, that's probably the best way to summarise it, yeah, I'll send you a confidential…

Yeah, a short document no doubt…
Yes, so I think yeah, that will be the best way to…

Yeah, that's great.
And choose what you want.

That'll be sufficient biographical material. Can we talk a bit about innovation, which is one of our themes here, what's the most innovative product or technology or strategy that you think you've ever been involved with?
So, if you look at, well Fujitsu of course was very much a leader in information technology. It was certainly the most significant giant killer that came on and took on IBM, it did that by offering not just hardware compatibility, which they had already helped Amdahl to offer. Amdahl ran IBM operating systems, it was a hardware compatible, but Fujitsu chose to be hardware and software compatible, so that was in itself, from a strategic direction that was huge, because it meant that in those days when you won a contract, so when Amdahl won a contract they won the hardware, but the operating system remain IBMs and therefore all the flow-on application business that went in it was, stayed with IBM, or with IBM competitors. But with Fujitsu coming on board, when IBM lost a business as it did, say, to the Australian Bureau of Statistics, it lost everything, so Fujitsu won everything. So the difference I think, and in terms of the success of Fujitsu in Australia, probably the commercial and contractual area was the most radical. You might remember, in IBM we did not accept any modification to standard contracts, we did not discount, we didn't provide guarantees, we didn't… the whole range of things that customers were beginning to ask for and eventually demand, IBM refused to do that. And IBM argued that because it was subject to a letter of consent or consent decree for again in anti-trust legislation, that they were not allowed to do that. Fujitsu on the other hand, and I don't know to what extent IBM had no flexibility at all, but it certainly worked very well for IBM because, every product was sold at list price, they had very huge margins, and IBM's profits in those days were also phenomenal. and it had this captured, they had three quarters of the world's IT market, it owned three quarters of the world IT market. So Fujitsu came in and it was willing to offer all of those things, guaranteed up time, guaranteed, with penalties, it would prime contract very readily and in fact prime contracting, all the competitors and software areas or hardware with IBM were keen to join with Fujitsu, because Fujitsu was very happy to take responsibility with them. So I think that, in terms of changing the face of computers, of IT industry, was what Fujitsu brought in; and of course subsequently then IBM too over time started becoming more flexible itself, so that really changed things quite dramatically.

The other was I think the quality of Fujitsu's hardware and software in terms of the Japanese quality was something we had not fully appreciated, starting with the Japanese cars coming in and of course the big boys always criticise them as being very tinny and being very, not safe where we had the big solid Holdens and Fords and things like that, but the reason that was the case again was BHP only made steel that was of that heavy gauge and so our car companies just had to use that. But eventually I think everyone realised that the Japanese were making beautiful cars and very reliable and elegant cars, but in the case of IT I think that's where it absolutely came up with quality manufacturing that was unsurpassed, and we started referring to it or very soon we could start talking about Fujitsu's legendary reliability and that I think

changed the face of computing, so they gave guarantees of up time. In all the time I spent in Fujitsu we did not have one occasion when the hardware went down. Software…

Any particular hardware of software product that you recall…?

Yeah, the M-series, the M-series for hardware, and of course MSB, OS4, F4, which was compatible with MVS, it was built on MVS, it was built on MVS when it was in the public domain because…

Yes, there was a very famous legal case…

And then it ended up in a very big legal case which has a history of its own, which in the end I would have to say was a draw, IBM sued Fujitsu for $10 billion. So there was no--that would have wiped them out of course, and Fujitsu entered into some payment arrangements for MVS, for F4, OS.4, F4, and MSB customers where a royalty was paid to IBM. But IBM wasn't satisfied with that, it wanted to go the whole hog, and Australia again became the centre of that dispute because were the only non-Japanese area where Fujitsu had started with its own products, and our system engineers, and this is a tribute to the quality of technology and expertise that Australia had, that our system engineers, Australian guys went to New York to give evidence, in the arbitration which was in the US, and produced this remarkable outcome. They also were very advanced in supercomputers and that also, so Fujitsu we installed the first supercomputer in Australia at the Australian Bureau of Statistics and that stayed there for, it continually got upgraded and I think finally a few years ago it was.. things had moved on.

Yes, now that litigation or arbitration in the US, you mentioned the Australian involvement, that was one of the, as I recall, wasn't that one of the spurs to open Fujitsu Australia Software Technology, FAST?

Well that was very different, I mean FAST, you're talking about FAST?

Yes.

Yes, so there I think I can take a, fair amount of credit for that. For that you've got to digress and talk about the Partnership for Development program, and that's a critical subject in Australian innovation, and it needs much more recognition than it deserved, than it obtained, it deserved much more recognition than it obtained. And the close down of that program I think was a severe loss to Australian innovation. And very simply the Partnership for Development program with John Button with his advisor Terry Hilsberg, you might remember, very aggressive, very good, and came up with this brilliant program where you signed up, in order to continue to do business with the Australian government, and included all the States, we used to have a thing called offsets, and the offsets was a very inefficient regime, because you didn't have to do anything unless you won a contract, and if you won a contract you had to do something immediately, and in one case all we had to do when we won our first telecommunications contract we had to do, we had to spend $1 million, and we gave an award to a guy, spend $1 million just furnishing a research centre. So the research centre had, it cost the million we spent, so it was a very inefficient scheme and John Button came up with this amazing scheme where you just had to sign up for seven years, achieve targets over seven years, so you could gradually and solidly build that program up. The Americans, particularly IBM were very much against that, they argued that eventually that it went against WTO, but we, because of that Fujitsu now had an obligation to it, because it was winning a lot of government business, we had an obligation to spend considerable sums of

money on R&D in Australia, and they did that by close collaboration with CSIRO. And we did it by setting up a whole range of centres, research centres, education centres, largely, anything that had a western flavour to it, so we started with translation where we had this massive number of Japanese speakers at the time, you might remember that, I mean Australia had on a per capita basis outside of Japan probably the highest number of Japanese specialists in the world, our people really took to Japanese, and so we could do outstanding, because we not only had good people but their quality of English was very strong and their understanding of technology was strong, so everything that had to do with the western flavour we would bid for and we would get, so an innovation centre, a systems engineer, a research centre, so FAST was the first of those.

What year did FAST open?
I would say in the mid-80s.

Yeah, I can find it, you recall I did that history of Fujitsu in Australia a few years ago, so it'll be in there. Back to the OS.4 development…

Could I quickly confirm with you guys, what was FAST standing for?

Fujitsu Australia Software Technology, it was a software development centre. Sorry Neville, going back to the OS.4 MVS arbitration, was any of that development done in Australia?
Yeah, not a lot, most of the things that we did in relation to that was proving that third party software could be made to work and worked, and take responsibility for that. It was more done I think in the supercomputer area, we had a person at the CSIRO by the name of Peter Claringbold, a very forward-looking person, and we also became part of a supercomputing research cooperative research centre with, where the ABS and CSIRO became partners, and that also did a lot of innovative work in supercomputing.

Was that because Australia was a good environment for supercomputing or was that because Fujitsu had a lot of supercomputers installed in Australia, why supercomputing?
Well, one is Fujitsu of course saw the supercomputing area as an opportunity, because of the time, IBM in particular didn't have exceptionally fast supercomputers, I think there were other companies, Cray was probably the dominant western one, and Australia did not have one. So Fujitsu saw that as not only a sales opportunity but also an opportunity to make a mark, so there was everything going for it, and providing technology that Australian Bureau of Statistics could use because they too were running into problems of processing time when it came to censuses, the side of the industry was, Hollerith had solved the problem with the US census, it couldn't be completed within the ten years that each census was held, and he developed the punch card to do that. So for ABS that was a big deal and of course because CSIRO was always heavily involved in that as well. So for Australia itself if there were supercomputer experts they developed at CSIRO and at ABS, that's where they came. The Japanese also sent specialists out here who became part of our staff, and therefore, could provide the support that these people needed.

So you would say that the environment in Australia was favourable because of the work that was already done by the ABS and by the CSIRO?
Well, I think the ABS or CSIRO had reached a point where it needed, I'll have to check this now, I'm mixing up now the two, I'm very sorry for that, but I'm, so the mainframes became bigger and bigger at ABS but CSIRO was the one that installed the supercomputer and Peter Claringbold was at CSIRO. And then they got into supercomputer research with their own

equipment that they couldn't have and they actually came up with quite a lot of innovation that was incorporated into Fujitsu supercomputers, so that Australian researchers were highly regarded by the Japanese, and also enjoyed the Japanese relationship. IBM had a very strong customer service culture, but in Fujitsu it was like total, if we could not get them to release a product because adapting it for the western market was very hard, all we had to do was find a customer who said they wanted it and Fujitsu would actually then do it. That concept of customer service was quite amazing, I mean, and that helped us a lot, but I've digressed.

Now in the 90s Neville we saw the relative decline or even the absolute decline of mainframes as people started to use, more the workload went to PCs and more importantly more of it to superminis, and Unix boxes and mid-range machines, what's your take on the decline of mainframe computing in the 90s and beyond?

Well I think it, the mainframe companies, with IBM as its leader, actually missed the bus there, and of course Fujitsu's business was fundamentally, the bulk of its business came from mainframes as well, also really was what lagged behind. In IBM's case I know the situation and I use it quite a lot when I talk about the importance of diversity, in IBM's case there was group think, there's no question, the company was so dominant, three quarters of the world's computing, we were doing everything right, we felt we were doing everything right, and we always, we felt the mainframe would always be absolutely essential and critical for really big applications and that view was held well, well into the 90s I'd say. And the challenge, although they started releasing the System/3 and then the 32, 34, and 38, which did very well over time, and minicomputers did well, but before they reacted, Digital had already become the world's second largest computer company, and then they made the same blunder with PCs, they built PCs reluctantly and Eldridge was the person asked to bring it out, and he also said you've got to bring it out in 12 months, so to fulfil that he decided to use parts so that you could just buy on the open market, and which he did, they then brought in, Bill Gates with his QDOS, "quick and dirty operating system", and the rest is history, they did not get the copyright for that and they let Bill keep that so eventually when the joint venture OS/2 failed all the applications had been written for MS DOS…

So then Fujitsu also missed the bus.

I beg your pardon?

Fujitsu also missed the bus.

Yes, very much so, very much so, and Fujitsu struggled. Eventually produced again beautiful, but never, somehow the price points and the ability to market, a cultural thing, definitely a cultural challenge. In IBM they set up seperate divisions to try and counter that and they worked fairly well and because it was an IBM PC they had dominance of that market for quite a long time, but eventually IBM decided to get out of the PC market and sold it to what is now Lenovo, which has done exceptionally well. And Fujitsu found it couldn't compete with the PC specialists, whether it was in distribution, and IBM, distribution or in manufacturing or whatever, mainframe companies just had a mindset and of course everyone running those companies had a mainframe background.

So in the 90s Fujitsu made, began to make the transition to being a services company…

Yes.

…which it now is, very successfully and one of Australia's largest, that happened while you were CEO, what was the dynamics of the move to services? Did you wake up one morning or you were in the shower once and thought hey, we'll become a services company, what was the process by which that happened?

Well they were, again, I was a person who was CEO, started off when I was general manager of marketing, but who actually pushed strongly for us. We had a couple of, a few things going for us, one is that we were quite happy to prime contract. So when you prime contract you effectively take responsibility and if you add margin to whatever services you collect and products you collect under your management. So that was a bit part of, a strength we already had. We also had the model, I mean that IBM went into thanks to Gerstner who decided that he wanted, and it was a radical thing to do, and he was not in the IT industry so he had no baggage to carry and he came up with this idea of changing to services. IBM had also been forced to get into services, well it was first to separate services from its hardware business, again, it was part of the anti-trust settlement, and that was unbundling. Unbundling by itself immediately meant you created a services market because you have to charge for it separately, IBM otherwise just bundled it with all its other services so services companies had to pay where IBM gave it to you for free, well not for free but it was bundled, you didn't, you paid the same whether you got services or no. So that became essential, and then Gerstner saw that as an opportunity, he saw that services would grow, which is quite a remarkable insight that he had or clairvoyance almost of the future, because hardware people just didn't appreciate that, but unbundling meant that IBM started selling services and then it was just a case of bundling your offering within a services contract, and it created that, it became a massive, massive services company, which is what it fundamentally is today, I mean the systems integration, the systems services it offers, and again Fujitsu Australia definitely, definitely led the Fujitsu world in doing it. The second big push came when Fujitsu acquired ICL, and ICL had gone that way in a big way, in Australia, in the UK, right through the world they were relatively not the same size as Fujitsu and IBM, but they were of course one of the two companies founded eventually by Hollerith, so they are, they did the British dominated countries and IBM did the rest, in particular the US. So that made a big difference I think, and getting closer and closer to ICL and that's where eventually out of Australia we pushed, the ICL management team and my management team pushed for, well, we called it a merger, but it was effectively an acquisition. The company, while we're talking about the Fujitsu family, the company that absolutely and totally missed the bus really, and that was because they were more IBM than IBM, was Amdahl

Yes.

Amdahl just couldn't accept that Fujitsu NSP was any good, even though they were in the family they were always very critical, they resisted merging with us, eventually that happened too, just before I retired, but yes, ICL was way down that path and the management team in Australia was way down that path, so when we merged we did, we got into all sorts of things, including hardware maintenance, third party products…

ICL was quite big in Australia, was that…?

Going back in time it was, a very substantial organisation.

Must have brought in a lot of expertise and some very good people.

Yes, so in terms of, in IBM we were conscious of the fact that we had educated the Australian IT industry or the global in some ways, and it was only after we merged with ICL

that I realised just what a major contribution ICL had made in recruiting and seeding talent in among its customers.

Yeah, I've been researching and we're actually researching the whole history of ICL quite a bit recently, it's a fascinating story.
Yeah.

Neville, going back to Fujitsu Australia's Software development, did that continue or grow or was it… was it an important part of the evolution to services?
Well… I believe FAST still exists, but nothing happened, I mean one of the things is when you work for big companies like IBM and Fujitsu you have this belief that things have got to be big, so for Australia I don't think, it was fairly substantial right through the Partnership For Development time. The work that we did in local English language based, western culture based innovation and whether it came to writing manuals, developing courses, and of course coming up with comparable solutions. So but my sense of the company now is that services that it provides are really based again on data centres, very large data centres, which it has done quite well in Australia, and globally, so cloud computing and all of that, they are very much so, but these independent activities, it's certainly not common news, so I am not sure how substantial it is but I can try and find out and let you know.

Yeah, so what do you think are the key drivers for innovation, how important are factors like government involvement or government support?
So I'm a very strong believer in government involvement. I think, I'm not against free enterprise and unquestionably the bulk of the Australian economy is free enterprise, but I always believe and still believe that governments have a role to play and governments have a role to lead and governments have the capacity to do it. So unfortunately when the Partnership for Development program was wound up, and let's make no bones about it, it was wound up because IBM in particular fought it tooth and nail, they criticised it no matter what happened, as I said, they argued that it was against WTO and that it was not the right way to do, to force people to do things, these things have got to develop in a natural growth market and so on, there's no question that Partnership for Development generated. The role that technology companies used to play, the manufacturers and software development companies was huge. Things have changed now, so now we've got the start-up culture, we've got small companies that can suddenly grow into big companies as we've seen with Atlassian, and therefore all of that has changed. Going back in time you absolutely had to have big companies involved because they were doing the fundamental research and they also had the equipment in universities and so on. The withdrawal from, I mean the closing down of the Partnership for Development program means now that involvement in research in Australia is entirely voluntary, you get some brownie points for it, there is no compulsion, and if you have no compulsion the big companies are going to do the bulk of their research in areas where they're dominant, where the bulk of their staff are. To me it's history now, we'll never be able to revive that, but I think that governments don't fully I think exercise their powers of persuasion, and the powers that they have as a big buyer, and unfortunately; well I'm jumping around now, the government did do, and I think needs to do much, much more in this area. Traditionally that's what governments did. CSIRO is one of the most outstanding institutions that was established early in the case of Australia, quite way ahead of its time, way ahead of the world, and the inventions that CSIRO came in every domain you want to think about, are just phenomenal. The Australian economy would not be what it is if it

weren't for CSIRO's contribution, whether it was eliminating myxomatosis or whether it was developing the Merino wool, it was across the board, and that was and still is government funded, and in our industry the biggest single things have been, were in NICTA, the Cooperative Research Centres, and AARNET, and my concern is that in those areas there is less funding, universities do a lot of phenomenal research, there's less funding for research at universities too, and then we have the classic failure which is critical to innovation in this day and age, and that's the NBN. I mean I feel very strongly about the NBN, and even though there's been, referred to as a backflip it still doesn't go back to what it should, what it was. I mean that's the sadness of all of it, whatever you would think about Conroy his NBN actually was world class and was future proof because the fibre optic base to the premises. We have still not gone back to that, still I think very strongly that we have to eventually get back to it but the way we are doing it now is step by step, painful step. So my concern is that, on the other hand, of course, the world has changed, and while we need a competitive NBN to compete with our competitors who have them, whether it is Korea or Japan or India, these countries are going forward with the fibre solution and over time I think we will do it, just like the rail lines, one day we will have a single gauge and it will be the highest you can possibly have. But government has to, I think, invest more but, it has gone back, and interestingly the most significant spending in IT research was done by a conservative government, Richard Alston was running for it and he was influenced by Brian Anderson, who was an eminent scientist at ANU, and they announced NICTA and I was fortunate to be part of the bidding team and we won, and so I became the founding chair of NICTA. What happened then though, and this is an interesting thing in Australia where we unnecessarily create competition or fighting, in-fighting if you like, it's happening now with today's papers, with SBS and ABC, and when I was chairman of NICTA it started happening with CSIRO. CSIRO had the best research based on users, and user expertise model in the world, I mean it was absolutely because it had eminent scientists in every domain that was important and every one of those domains had IT people in-house with them, working cheek by jowl with them. So here's a base to innovation, they were among the best in the world. What happened is two institutions, and the competition didn't start by NICTA although it was partly responsible for it, but CSIRO decided, and I don't want to name names, but they decided that their territory had been usurped, and so they decided to congregate all their IT instead of having them with the users, which gave it its strength, and created an IT research centre within CSIRO, and that meant that you actually were losing your domain-based skills because it's that togetherness that actually fosters these ideas.

That didn't last, but also NICTA at that time had had one of our leaders who felt that we should go, he believed in Pascal's quadrant and the term used was user-based research, which was exactly what CSIRO did, and so we started moving instead of focusing on IT, we started focusing on user-based research, so suddenly, and I know with both organisations including NICTA that I chaired, and this is a dumb decision because they're going to look more like each other and as soon as that happens one day down the track someone's going to say why do we need two. And that's exactly what has happened, and NICTA has been closed down, I feel very personally upset by it all, there was a Neville Roach laboratory in NICTA that it had established, and so NICTA is no more. It's now Data-61, very good organisation, no question about that, but it is a part of CSIRO, that independence which it brought. When it was set up I think people don't realise it was one of the most significant R&D initiatives of any government anywhere in the world, hugely funded, at a time when governments were actually backing off and we were there for, became a world-class, world-scale organisation within years, within a few years, and then when David Skellern came back to head it up, I

mean it just went through the roof, it was a brilliant success, and while I don't doubt that Data-61 will continue to do good work and CSIRO if we continue to manage it positively, I think there's, now I don't know what the design would be.

What would you advise, if you were an advisor to the government what would you advise them to do?

Well, at this point I think all one could advise is that they should invest more money, because instead of looking for ways to save money. That's the biggest single thing that I would advise. The challenge of recreating a NICTA and then setting it up separately from CSIRO, I think that's now an insoluble problem, and it happened…

Sebastian, you had a question.

How would you invest that money, I mean investing more money is good but what would you make priorities for investing money for the Australian government?

Well the challenge now I think is that the industry now is unquestionably, and R&D also, is global. I think that now the biggest most significant way in which we can spend money is to spend more on university research, to fund universities significantly higher. You're at Sydney University so you would know this, but academics at Sydney university, researchers, are required to help bring in money for their own research, I mean that is just scandalous, these people who are brilliant scientists or researchers in the social sciences, in arts as well, I mean in every sphere they've got exceptionally good researchers in our universities, but their monies are being cut and as a result they're thrown into dependency on overseas students, and there's a lot of merit in having overseas students, but using them to fund everything is a bad decision. So we've got to give researchers, and we've got to attract world-class researchers and we've got to keep world-class researchers. Australia has got an amazing number of outstanding researchers around the world. What's it called, the Roomba is it, that cleaning machine that you have that rotates and collects that, that's an Australian invention, an Australian professor at MIT invented it, and he brought a prototype to NICTA when he was on our Advisory Council, I mean I give that as an example of, but there are any number of great stories of Australian researchers doing very well overseas, and the problem is once you lose them to the US or the UK then it's very difficult for them to come back. So doing what we can to keep them, doing what we can to attract them. Again, using our university education system to bring in top researchers to complete their PhDs here and work with some of our best people, these are the things that, I mean we don't have the funds and the clout to match the US or China. But China has a thing, and if they want a researcher, the best researcher in the world let us say, they actually will go and do their research, find out who their best people are, and they will go to them and ask them what do you want for you to locate something in China, and the biggest thing that people want is they want eminent researchers to work in a team with them, and China is quite willing to set up a facility, a laboratory there where this eminent professor can get the association of other eminent professors that that person needs to do their research. So we can't match that, but we have a pool of Australian researchers both being developed as we speak but who are established in and around the world. I don't believe that we do much, we certainly don't do enough, to attract them to come back or to engage with our researchers to guide them, to help them, and so on.

Yeah, we see a lot of…

And I think it's almost by accident, I mean the Atlassian thing is an example, I mean just a couple of brilliant people who created this multibillion-dollar company…

We see a lot of innovation in Australia, you mentioned the quality of Australian researchers, is there something specific or peculiar to Australia that gives us these sorts of people or throws up these sort of people, something in the Australian psyche?

Look, I used to always believe that the tyranny of distance was what hurt our IT industry, I believe that, even though we used to talk about it being a global industry and so on, and the reality was why does Finland do so well and we've got an Asia on our doorstep, we didn't take them seriously enough. Finland has got Europe on its doorstep and we look at the success, Silicon Valley succeeds because you've got this critical mass of eminent people, all innovation, and then that, and we sort of lack that, but now what we always said, the tyranny of distance would be conquered by technology, now I think that is absolutely true. It is possible now to, as we are doing now right, we can't meet physically and we're working together. With the technology now and provided we have a world-class NBN so we can communicate with anybody everywhere, anywhere in Australia particularly, at the top speeds available, you can. I believe the two countries, and I'm very close to, have an affection for, one is Australia, the other is India, in both cases I think we are beginning to see signs that start-ups can be done out of Australia and a global market can be created out of Australia. And I think before I used to feel that it was only in the medical area where we, with 25 million you can't get critical mass, but today I think it definitely applies to IT and we can do it now, but we have to create the connections and you've got to spend money to do that. I don't know what we do now, actually, I mean I'm not saying that things are not happening, but I don't get a sense of big things happening in Australia the way we used to know they were happening in the 80s, 90s, and early 2000s, yeah.

So what sort of skillsets did you look for when you hired people, what qualities do you look for in a person?

In Fujitsu you mean?

Yeah, what sort of people did you hire, what were you looking for, technical skills, personal skills, flexibility, intelligence?

Well obviously technical skills are very important but I think we need, today the sorts of people that you've got to get are people who are willing to take risks with their lives, and I think today the risk is very, very big but it is much less than it was. To create the giants of the past you couldn't do it like the way Atlassian has done it here, so we need more and more role models like that, and I would definitely be looking for people who are willing to take risks, who are willing to set up start-ups, who are willing to work internationally, and who have the ambition to do it and to take those risks. This has always been the case but today it is possible to do it, but we need more people doing it here, because I still think physical presence at universities, and knowing that you've got this world-class person, I mean UNSW must be benefitting immensely from Clinton Brooks being a student there and an advisor to them, you can go and talk to him. At NICTA we used to have people like that, that, so taking, today I think people are going to have to look well beyond the Australian market and look well beyond it very quickly, so and they have to look, they must be comfortable collaborating with countries in our region, I think that will be one of the big things that will feed, the underlying culture in Australia is still to be more comfortable with the US, with the UK, We

now have made a lot of progress in our relationship with China, but currently those relationships are fraught. Our relationship with India are really nowhere near what they could be and should be. India is taking off in a big way with their innovation, start-ups, young people there are, traditionally the thing you did was you did everything you could to get a job and you worked with the company for the rest of your life, that was what I would have done had I stayed on in India. Today they don't want to, the IT industry jobs, there are huge numbers available. Fujitsu, I mean ECS employs 450,000, there are massive employment there but still the young people, the graduates when you meet them they don't want to do that, so I think that where we can do well is to use a migration program more selectively, offering incentives, and making it very easy for the top brains to actually migrate here, we are making it more and more difficult for them, it is unbelievably difficult for a student to come here and get permanent residence and become a citizen…

Yeah, and what sort of students, at Fujitsu did you hire graduates and if so?
Yes, yes, I think…

What were you looking for, what sort of people?
Going back to what I learnt at IBM. IBM had sort of three criteria, one is it had its own aptitude test at the time which you had to do well in, the other was you had to be a graduate and they didn't mind what the degree was, they just wanted you to be a graduate because they trained you in everything, and the third thing was that you had to have had a job of reasonable significance, so that you had showed your ability to hold down a job and to commit to a job. They were the three things, and Fujitsu did much the same. The one at IBM was its trainee program, and when it stopped, when it ran into difficulty it stopped its trainee program. In 1970 it stopped its trainee program. No-one noticed any difference for about seven or eight years, and suddenly that stream of trainees that used to come in every year hadn't been coming for seven years or so and the business started booming and we were desperate, because we just did not have that large number of people who by then would have been developing well and basically helping around the company. So I think helping young people to choose, to take risks, to choose an IT career, but helping them not necessarily to join, we need our companies to be willing to sponsor them as part owners of their business, as ones who have got a brilliant idea but need a user to foster what they've got, all these things are possible, but it's a mindset, and I don't think that corporate Australia has yet got that mindset. I think we might have it in the mining industry and perhaps in the medical devices are, so we've got ResMed and Cochlear and things like that.

Now you were involved with, I think you were head of the AIIA at one stage.
Yes.

What role do societies and professional bodies play in the industry do you think?
I think these bodies, the two dearest to me are the Australian Computer Society and the AIIA. To some extent they have lost their paramount position. In the case of AIIA it is understandable but in both cases there was a lot of self-inflicted wounds, and ACS as you know is currently going through probably a near death experience…

Yes, I am aware as you know.
Thanks to self-inflicted wounds, I mean it's quite tragic. But AIIA ran into financial difficulties on a grand scale, so they no longer have the clout that they had then, as chairman

of AIIA, I mean we had a seat at the table, we were able to get directly to the Minister, to John Button for example, and discuss everything, he'd give you the time of day, we were able to bring in the World Computing Conference in Adelaide which we ran. Those organisations played a big role. There was warfare within the AIIA, the Fujitsu/IBM dispute was in the open in the AIIA, so I'm not saying that. We competed with each other fiercely. The biggest challenge that AIIA had at the time was convincing Australian IT companies that actually they had more clout running the AIIA than they accepted. They felt that they didn't and it was always run by the big bad multinationals, but that just wasn't true. Big bad multinationals funded the organisation, because we paid much more than the others. But today I don't think, I think the industry has now become, it is such a fragmented, not fragmented in a negative sense, it is such a rich, diverse industry that I cannot imagine an all-embracing IT industry body, and I can't imagine an all-embracing Society. A professional society should have been able to modify and adapt and to be the meeting place say if you like where corporate IT and start-up IT found a place to work with each other. And at present I don't believe that there is anything of great, of that kind of role being taken by either the AIIA or ACS, but Graeme, you would know much better than me I think what's happening, no, you see, because you are still very active in the industry and you're in touch with the industry so…

Okay, so well that might be a good spot to end, but we like to end on a high note Neville, what are your biggest disappointments?
What?

Your biggest disappointments, either personally or for the industry, what do you think should have happened better or disappoints you it didn't happen better?
Well I think that making Australia a global hub for innovation, for research and development and innovation in a comparable, on a scale, we should have been able to rescale this, particularly after we realised that Asia was on our doorstep and we get comfortable working with Asia. I think we really should have done much, much better and we should have built significantly stronger links with the powerhouses when it comes to people, which are China and India, and that's a lost opportunity. But it's not a lost opportunity because the numbers are, particularly with India, are going to keep coming, and you've only got to look at what Indians have achieved in the US and the UK, it's quite stunning, I mean the CEO of Google is, Microsoft, like I say, we are beginning to see signs of that. So using our migrants I think we have not used them on the scale that we could have, but it's not gone forever, I mean the industry keeps evolving and new innovation is going to create more opportunity. Our challenge is we were going to have to create, I mean when you look at technology, big technology companies or science and technology companies, we only had them in the medical sphere, CSIRO, Cochlear, and ResMed. Atlassian has shown that we can do it. So so far I think for all the innovation that Australia has contributed to the world my biggest regret is that we have very little to show for it. The other is we've got to keep promoting ourselves and make sure people appreciate how good we are, and I can assure you it is very challenging, the reputation of Australia is very sound when it comes to support, being competitive, and all of those things, but representing. as I now do Data Consultancy Services, one of the things that when you go to India you realise there's a complete ignorance about how advanced Australia is. People who come here for the first time I are just stunned at how multicultural Australia is, so there is an image there, so we've got to dispel and we've got to get rid of racism and bias and the way we treat our Indigenous, all of those things, all of those things hurt us, but also the fact that we are exceptionally hard working people is also something

that's not appreciated. So I think promoting our image and for the IT industry to promote our image is absolutely critical. I'm not aware now to what extent the Australian IT industry, the leaders of Australian companies, actually give to the industry as much as people in my generation did. I mean we put in a lot of time into the AIIA, into the world bodies, into a socio. It may be happening but I don't sense, I don't know, so the regret is I think given all the innovation that took place in Australia with Wi-Fi being developed here, I mean we should have been a multibillion dollar industry. I mean Atlassian would be one of 20 companies, and there's no reason I think why that can't happen, we're going to have to make sure that we don't keep losing talent and that we keep bringing talent. I mean we are the luckiest people because we can, we've got an immigration program, and for all the challenges of COVID-19 we will continue to need immigrants, and it's continued to be an attractive country to migrate. It's a challenge to then keep the business unless we create opportunities for them, and today and maybe forever they will always choose the US first, the UK second, perhaps Canada third, and dare I say it perhaps New Zealand fourth and us fifth. So that has, given how many people we have educated and how strong we are in that area, we've got to really bring more people here and keep them here, and we have to do that by linking migration and education together. One feeding into the other, I mean it's a huge benefit that we have, people want to come here. It's a great country to live in, there are lots of smart people who do very well, the climate is good, but are we really attracting the best, we're getting outstanding people, don't get me wrong, but then we make it so difficult for them to stay here that if you're really able to get a job somewhere else people just go, they just don't feel wanted, so I don't know, just a bit of a rambling answer there but…

No, no, it was very good, a good spot to end. Sebastian, do you have any other questions? Maybe only one small one, look, sorry, it seems my microphone is a bit soft, one small question, did you or Fujitsu, I should say, ever engage in going to universities to support education? IBM had this program where they sponsored students at Monash and UNSW and they paid for the tuition, did something similar happen from Fujitsu?

Well, it did happen, certainly in my time it did happen, and we particularly developed strong connections. ANU was our most preferred partner and we had a Centre of Excellence based there, particularly in supercomputing, CSIRO was also a particular partner. What Fujitsu is doing now I don't know, but IBM, if you look at IBM one of the biggest initiatives that it took, which linked a university with IBM was at Ballarat, and Ballarat and John Harvey was the person responsible for doing it, the regional centres I think, regional universities offer the greatest promise for a whole lot of things, and they are struggling because they lose their best people who leave. So Tasmania is a good example, 50 percent of all the graduates just leave, so what IBM did at Ballarat, and I'm really trying my best to convince DCS that we have to do it in two or three other centres. They set up a development facility in Ballarat, and as a result of that Ballarat students not only started taking more IT, choosing IT, but actually continuing to live there because when they graduated they could work for IBM, a very virtuous relationship, and I think that is a model that again, came very close to setting one up at Deakin but unfortunately ran into trouble, but I believe that that universities should be pushing major corporations to set up development centres, give them incentives, give them whatever to get them there and as a result of that the IT, and smaller towns can be ideal place for innovation, but people have to leave, and they don't want to leave, their families are there, the cost of living is better, the quality of life is better, but they have to have a reason for continuing in their IT careers, and IBM has proven that, and that's really something well worth looking as a model to do that. When it comes to research I think unless, and doing good things in the country, unless the government becomes more aggressive, and aggressive

is a word people don't like to use, but let me tell you, John Button in his particular style, I mean just was persuasive, but he had Terry Hilsberg who was aggressive, and between them they got every big corporation in IT to sign up to the Partnership for Development. Somebody should have the wit to look at that, companies are not going to do it unless they have to, and they only have to if they understand that their business opportunities with government will grow up the better they do and they more they do for Australia, and it won't be token stuff, it'll have to be real stuff. Then that is possible, but governments are going to have to, and that's a challenge we have, governments want to get out of business and they want to privatise the NBN, there's a whole range of things, and let's be realistic about it, that's not going to happen under a conservative government. NICTA was an incredible exception, the only side of politics that traditionally has helped technology, education, and so on, has been the Labour Party, but that I think will change. I don't think, right now if you ask why would a company do it, I think they would do it to improve their brand, to have people see, for Indian companies at the present it's very important for them to show that they are doing good things in Australia because there's always the argument about what you haven't talked about, offshoring or outsourcing and offshoring, which is a very big part of the industry which is here to stay, but we can get all those companies to do a lot of good things in this country, and R&D absolutely when it comes to software and services, they are all in the forefront of doing it, and I think we should get them to do more in Australia.

Thanks Neville.

Thank you.

Any closing remarks?

No, I mean I think that I've had a very fortunate life and career, the IT industry has been very good for me, but I think there are institutions that exist which are gradually losing their dominance, but that doesn't mean we should give up. I mean one of the most prized awards that I received is the Pearcey Medal, because it covers the lot, right, it's industry, research, and the professions, and now it has to piggyback on another institute, occasion for giving the Pearcey Medal, whereas it used to have its own, and I wish we could resume that, but again the cost and how to do that, I don't know, but I still think that the industry now has become the engine of the world that everyone said it would, but it's only at its infancy, really, by the time it works to enhance the livelihoods of everyone in the world it's going to be thousands of times bigger than it is now.

Okay, well let's wrap it up there, Neville, thank so much for your time today.

End