Alan Newell OBE

Interviewed by

Elisabetta Mori

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Via Zoom

Welcome to the Archives of Information Technology. It's 24th January 2023 and we are on Zoom. I am Elisabetta Mori, an interviewer with Archives of IT. Today I'll be talking to Emeritus Professor Alan Newell. I am in Tuscany, Italy and Professor Newell is in Dundee. Alan Newell is Emeritus Professor at Dundee University. He has spent over 40 years in conducting research in human-computer interaction, primarily into supporting elderly and disabled people. He founded and headed the University's School of Computing and later set up the Queen Mother Research Centre, an important academic group researching digital systems for older and disabled people. He was the deputy principal of Dundee University between 1992 and 1995. In 2000 he was awarded a membership of the Order of the British Empire for services to IT and communication for people with disabilities. He is a Fellow of the British Computer Society, a Fellow of the Royal Society of Edinburgh and an Honorary Fellow of the Royal College of Speech and Language Therapy. He was named ACM Fellow in 2006 for his contribution to computer-based systems for people with disabilities. In 2011 he was awarded the CHI Social Impact Award. Finally, in 2012 he was appointed to the ACM CHI Academy. Welcome, Alan.

Hi.

Where and when were you born?

I was born in 1941 in Birmingham, England.

Can you describe your parents, what were their occupations?

My father was a motor engineer and my mother was a milliner.

What about your grandparents?

I really don't know enough about them to tell you.

That's fine. What was your family life like? Did you have any brothers or sisters?

I had an older brother.

What are your early memories? What was your family life like? Or who were the important influences on you in your early life?

Bearing in mind that it was immediately after the war, family life was fine.

Can you trace your education through early schooling, secondary schooling, college and higher education?

I went to the local primary school and then I won a scholarship to a grammar school, which some people might remember, grammar schools. And in my grammar school days I focussed on engineering and science and then I applied for and was awarded a scholarship to Birmingham University where I studied electrical engineering.

In 1962 you finished your Bachelor in Science, in Electrical Engineering at the University of Birmingham.

Yeah. And then I went on to do a PhD in the same department, in the electrical engineering department.

What was the topic of your PhD?

The topic was the subjective response to patterns. And I looked at the ways human beings discriminated certain patterns, visually. And that involved me having to understand a bit of experimental psychology. So that's how I moved from being a straightforward engineer to an engineer/experimental psychologist, which was exactly the right background for someone who wanted to go, who ended up in human-computer interaction.

[00:04:54]

But at the time the discipline of human-computer interaction didn't exist yet, so…

Well, computing hardly existed then, let alone human-computer interaction.

Where did you gain your expertise in psychology?

By reading books.

And then, what happened after you finished your PhD?

Then I got a job as a research engineer in a company that thought it was going to make speech recognition machines.

What was the name of the company?

Standard Telephones and Cables.

What was the subject of your research at the time?

That was to investigate speech recognition.

Which computers did you use at the time? Can you tell us a little bit about your lab there?

Well, the highlight was that I had a, one of the very early laboratory computers, which was a PDP-8, a Digital Equipment PDP-8, which had 4,000 words of storage, would you believe it?

And in particular when you were at Standard Telephones and Cables, you developed VOTEM.

I didn't believe at that stage that speech recognition would be capable of being built in the near future. So I suggested that perhaps we could- the one reason, one area where it could be useful was by disabled people who had no manual dexterity. And so I thought how can we develop a computer system that worked on voice, and that's why I developed VOTEM, which stands for Voice Operated Typewriter Employing Morse Code, because the user spoke Morse Code at it. And the advantage was, one of the

advantages, was that if you said ‘five’ and the computer recognised that as nine, how do you say a ‘five’, which is more like a nine. Whereas if you say ‘dit dit’ and it types an ‘O’ your dits are too short, too long. No, too short, yes. So it’s very easy on the basis of the recognition that you could change the way you spoke Morse Code at it, because you knew that all it was doing was measuring the length of the sounds that you made.

So can you give us an example, like ‘beat-beat, beeeeat, beeeeat’, something like that?

Well, if you wanted to type an ‘S’ you typed, I think you said ‘dit dit dit’. And if you wanted to type an ‘O’, I think you said ‘dah dah dah’. But my memory of Morse Code is long since gone.

So after working for Standard Telephones and Cables, you went back to academia, in particular you arrived to the University of Southampton. So what…

That’s right. Sorry, what did you say?

Arrived to the University of Southampton in 1970.

Yeah.

So why did you choose to go back to academia, or did you just happen to…

Because I didn’t think I fitted in very well with industrial research.

And at Southampton you developed the Talking Brooch, that was a small rolling alphanumeric display that was worn on the lapel and operated via a handheld keyboard.

Yes, and that was for people who couldn’t speak and the reason for the design was that I thought it was important that you should retain eye contact, because up till that point, non-speaking people used teleprinters or typewriters to communicate and they

didn't look at each other. They just looked at what was being typed. So the idea of the Talking Brooch was to retain eye contact.

[00:09:57]

So, the Talking Brooch was also a major factor in you being awarded a Winston Churchill Travel Fellowship in 1976 to visit researchers in…

That's right.

So can you tell us about this experience in the US – where did you go, who did you meet and the like?

Well, the advantage of the Fellowship was that they paid for the travel, so I did a sort of grand tour of the States, essentially, and amongst the people I met was a woman called Penny Parnes from Toronto and another woman called Arlene Kratt [sp?] from New York, and there were one or two people in San Francisco and some in Kansas. So I went round and I, particularly with Arlene Kratt [sp?] and Penny Parnes, I retained that, those contacts for a long time, and Rick Foulds was also from Boston, who was working in the field.

And when you were back in the UK, back to the UK, you happened also to give a demonstration of the Talking Brooch to a Member of Parliament.

Yes. What happened was that the Member of Parliament was visiting the department and I decided to display the Talking Brooch to him. And he said, he was a colleague of Jack Ashley who was an MP who'd become deaf, and he said that's just the sort of thing that Jack Ashley wants, would need. So I then made contact and talked to Jack Ashley about it. And it was clear that it wouldn't be any use to him, because the way he operated in the House of Commons was that somebody sitting next to him would write little notes about what has been said to him, which he would read. And the disadvantage was that some aside would be made, which would be picked up about three speeches later and cause hilarity in the House, and he wouldn't get the joke

because the person who was taking notes had not realised how important it was, it was going to become. You understand?

Yeah, yeah.

So at that stage, because of my research in speech recognition, I knew about machine shorthand and I decided that what he needed was a, in the UK, a Palantypist who would use machine shorthand and she would then type verbatim what was said in the House and he would be able to read it. So we went back to Southampton and we developed various systems to do that.

And were they used commonly then?

Sorry?

Were they used regularly then?

It was then installed in the House of Commons, yes. And I think it was the, in fact I'm sure it was the first computer system, or electronic system to be installed in the chamber of the House of Commons. And also, when it became computerised, it was the first computer system to be used in the House of Commons. And Jack Ashley used to have a screen in front of him and the Palantypist sat in the foreign press gallery and he used it for a number of years.

[00:14:27]

So in 1980 you moved to Dundee University.

Yeah.

What brought you there?

Sorry?

What brought you there?

Oh, it was a job came up and it seemed to be a nice place to go.

And during the years at Dundee, where you actually stayed until you retired, you developed several bits of research.

Yeah.

In particular, in the eighties and the nineties your research interest was to support disabled people and focus on non-speaking people and development of augmentative and alternative communication systems. Can you talk about a few of these projects?

Well, one of the things that we focussed on was that most of the devices that were available at the time focussed on needs of the disabled people, you know, are you hungry, are you thirsty, and so on. And it's not actually easy to have a conversation and make friends with somebody who all you can do is to tell them you're hungry. So I was more interested in devices which would enable you to have more, what one might call normal conversations. And we, one of the first devices that Norman Alm, my colleague, developed was called CHAT, which enabled you to very easily pick out from a number of general phases so that you could… you start off the conversation and you have a number of ways of saying hello and you can choose that, whereas in the, using the old system you would just type H-E-L-L-O, whereas our system stored various versions of 'Hello' and once you'd said 'Hello' you expect the other person to say 'Hello', so you would then have presented with you a number of messages that you'd developed in the past which were feedback remarks, feedback to 'Hello'. And at the end of the conversation it would provide you with methods of saying, you know, phrases which implied 'Goodbye', 'Nice seeing you' and so on. So it enabled you to, with a single keystroke, to say polite statements, or even impolite statements if you wanted to. So it enabled you to socialise more easily. And we took that further and looking at, with my colleague Annalu Waller, looking at the sorts of conversations you would have if you're in a restaurant. And the thing would know the sorts of ways in which you'd, the conversations would go in a restaurant and

would suggest a number of phrases which were appropriate to that point in the conversation. Is that clear?

Yes. So this is also one of the examples you provide in the book you published in 2011, Design and the Digital Divide.

Yeah.

Can you describe your research and the insight you gained from it? So the first question is, what is the digital divide?

It's the fact that a significant proportion of the population are not able to use technology and therefore there's a divide between those who can use technology and those who can't and that has got worse and worse in the, as technology got better, so it tends to make people not be able to, make it so difficult that people can't use it. And that applies particularly with older people.

[00:19:47]

So in your book you also talk about a shift from possibly user-centred design to user-sensitive inclusive design.

Yeah.

Can you talk about it please?

Well, the idea was that you shouldn't, you should be sensitive to the user's needs, rather than centred on the user. And that it's also inclusive, it includes the whole range of human beings, not just the young eighteen-year-old, physically fit, mentally capable person that most technology is designed for.

And what about the concept of ordinary and extraordinary human-computer interaction?

Well, that's another way of saying the same thing, that the… we tend to design for what people call 'ordinary users' and I'm interested in 'extraordinary users', so that's a positive way of looking at people with disabilities. And the other concept is that the, an ordinary person in an extraordinary situation, such as a pilot flying a high-performance aircraft is in the same position as an extraordinary person, a disabled person, in an ordinary situation using a typewriter because they're both constrained by the HCI bandwidth between the person and the human being. So we can learn a lot about HCI from looking at disabled users. In some senses they're the canary in the coalmine.

What led you to found the Queen Mother Research Centre? Can you tell us a little bit more about what it is and what it does?

Well, I was conscious that there wasn't a great deal of research done on the problems particularly older people had with technology and therefore it seemed to me important to start researching in a big way in that area. And we had a contact with the Dowager Countess of Strathmore and I thought it would be nice to have the name, the Queen Mother Centre, so the Dowager Countess arranged for us to have permission to call it the Queen Mother Research Centre.

What year was this?

Sorry?

What year was this?

I can't remember that. It was 1990-ish.

Okay. In the early 2000s, actually in 2000, you were awarded a membership of the Order of the British Empire…

Yeah.

… for services to IT and communication for people with disabilities. Did you expect it?

Sorry?

Did you expect it?

No, no, it… one just gets a letter saying that you might be awarded it and will you accept it if you're awarded it. And so I wrote and said yes.

What do you remember of the day of the ceremony?

It was nice to go to, we had it in Buckingham Palace, it was nice to look round the Palace and the pictures and things.

And in your research you also used theatre.

Yeah.

[00:24:40]

Can you say about the use of professional theatre for raising awareness and gathering requirements for research? Can you talk a bit about this kind of use of theatre in research? Which is a bit unusual, we could say at least.

Yes, well, it… the background was my wife ran a theatre company and she used actors to discuss sensitive issues, to encourage the audience to discuss sensitive issues and things. And it seemed to me that that was exactly what we needed with HCI, we needed to see users not being able to use computers and to discuss with them why not. And it's not too easy to do that with real disabled people or real older people, because they think that you're getting at them, whereas if we used actors we could write plays which demonstrated the sort of problems they had and after they… a short play was presented, then the audience were able to talk to the actors about the problems they

had and there was no embarrassment because it was an actor, it wasn't a real person that they were accusing of being useless or whatever.

So there were also research benefits for this?

There were many research benefits, yes. And we have shown that at a number of international conferences and it went down very well with the audience, they were able to ask questions which I don't think they will have thought about before.

So if you look at the evolution of human-computer interaction from the 1950s until today, what do you see as, you know, the main, the main milestones and looking at them, what do you see as the future of human-computer interaction?

Well, from my perspective the main milestones were when Windows and What You See Is What You Get appeared, and blind people who'd been able to use computers until that point were not able to use it any more, because they couldn't see the screen, whereas they were quite capable of using command line interpretation. So that's one of the examples of where allegedly a move forward has put a number of people at a disadvantage. And what's been happening more recently is that manufacturers seem to think that they've got to have something new, so whenever things are working in such a way as I can understand them – I being an older person – then they change them. So it completely confuses me and they have various metaphors which they think work. And we had an example right at the beginning of this discussion where even you found it difficult to use Zoom and didn't know what to do. But they put lots of things on the screen with no… and if there's too many, too much writing on the screen, it's not easy to discern what you should be doing because you can't find it. And so as computers have got more complicated, human-computer interaction has become, you would have thought it should become clearer, because they've got so much power behind them, but all they do is make things more complicated for the user.

[00:29:45]

So what do you see as the future?

I don't know what I see as a future.

What about the future of the digital divide?

Well, it's not got any easier over the past few years in terms of the divide between older people and ordinary people and I see no, nothing that makes me happy that it will get better.

So you don't think that IT will improve disabled and elderly people in the future?

Well, it'll, it improves, it enables some disabled people to do things they couldn't do before and it's certainly got a, has made a lot of difference to a number of disabled people, but it's also made it more difficult for some categories of disabled people to take part in society. If you… And the… it's now impossible to talk to anyone on the telephone, for example. If you have a query, you have to go via the web. Now, if you haven't got internet access, that's you without a bank account, isn't it? Whereas it would be fairly easy to make it so that the things that you provide were available to disabled people.

What are the proudest achievements of your career?

What are the proudest achievements of my career? I think the House of Commons thing was an important one. The AAC devices were very important. And, as you say, recently the use of theatre in HCI. So I think the proudest thing I wanted to achieve was to get the general population of HCI users to be aware that there were a great number of people that they weren't addressing. Now, whether I've achieved that, I'm not absolutely sure.

Do you think there is a specific British contribution to HCI from, you know, one of your research, or others?

I think that British researchers are more interested in the sociological aspects of computers as opposed to American researchers, who are – these are gross generalisations – who are focussed on the technology rather than the people. So I

think Britain has, the British researchers, have raised the awareness that human-computer interaction is about people, not about computers.

Would you like to remember any of your colleagues that worked with you?

Well, I mentioned some of them. Everyone in Dundee and my group in Southampton were all very helpful. From Southampton there was Andy Downton and Colin Brooks and John Arnott who moved up to Dundee with me. And in Dundee there's Norman Alm and Annalu Waller, Ian Ricketts. Whole host of people.

[00:34:31]

Were you ever involved in the Alvey Programme?

I was at one stage, yes.

In the 1980s, yes. Can you talk about this briefly?

Well, the Alvey Programme, as I understand it, was to develop a speech recognition machine and the ideal was what was called a listening typewriter. And my concern was that a listening typewriter would not be particularly effective. And we still haven't… So the, when the Alvey Programme was launched, I suggested that I should use my Palantype transcription system as a 'working' speech recognition system, so we could find out how real human beings managed when they're trying to use a talking typewriter. And one of the more amusing parts was that the, a guy had dictated a whole letter and he ended up by saying, 'delete the bit between' and he mentioned a word at the beginning and a word at the end. So he lost all he'd done, you know.

Okay.

And the other one was when the male student who made a mistake, used, swore at the computer, and the computer obviously typed his swearing and it went on for a bit like that, and at the end of the experiment it had been agreed that we would tell the student

that it was being done by a machine, an operator, and he was most embarrassed to find out that a middle-aged woman had been typing his swear words back at him. [laughs]

So when… when you think about your career, what you have achieved, what advice would you give to someone that is willing to work in your field today?

I would advise them to read my book, because it, throughout it's suggesting various approaches that you should take to research and one of the things that I mention is the motto of the SAS, which is 'He who dares wins'. And you must be very… you mustn't follow fashion too much. Because all life is fashionable, all research is fashionable and the way to get on is to be a bit unfashionable. Act a bit like a maverick.

Is there anything you would like to talk about we haven't discussed today?

I don't think so, no. That's been interesting, or I hope you found interesting.

Yes. So, thank you. It was really lovely talking to you today. Thank you Alan.

[00:39:08 recording ends]