Gilbert Cockton

Interviewed by

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In Edinburgh

Welcome to the Archives of Information Technology. It's 15th February 2023, I'm Elisabetta Mori, an interviewer with Archives of IT. Today I'll be talking to Professor Gilbert Cockton. We are in Edinburgh, Scotland, at the local university. Gilbert Cockton is Emeritus Professor of Computer Science at the University of Sunderland and Emeritus Professor in the School of Design at Northumbria University. With degrees in history, education and computer science he was one of the leading figures in HCI and interaction design in the UK. He has mostly worked in university in computing and design, with periods in industry. His Balanced, Integrated and Generous – B-I-G - paradigm for design seeks to combine the strengths of creative, engineering and human-centred design in ways that neutralise individual weaknesses. He is a Fellow of the Royal Society of Arts, he was a Fellow of the British Computer Society, he is Distinguished Speaker for the Association for Computing Machinery and recently got an ACM SIGCHI Distinguished Service Award. Welcome Gilbert.

Thank you. Thank you for asking me to be interviewed.

So let's start with where and when you were born.

So I was born in 1958 in the West End of Newcastle, in Low Elswick, a very industrial area, there was still a lead shot tower down towards the bottom of the street, and I lived there until I was fifteen months old and then we moved to a council estate on the outskirts of Newcastle, Montagu Estate. I went to the local school there. My brother, four years older than me, went to, passed his eleven-plus exam and went to grammar school, but after two years they, Newcastle stopped having grammar schools, stopped having the eleven-plus, and my school, my primary school headmistress came to visit my parents and suggested that they put me in for the Royal Grammar School, the direct grant school. And this happened with many of my friends at the Royal Grammar School at Newcastle, was that their parents hadn't been thinking at all about sending their children to this fancy posh school in the centre of Newcastle. But many of us in those years would have gone to grammar schools with older brothers and sisters, but they'd stopped them. So for a while teachers really wanted children who, you know, would have passed the eleven-plus to go to a grammar school, so they directed them towards the RGS. So I was at the Royal Grammar School from 1969 to 1976 and I became very interested in history there, so

at A level I did history, and then I did Latin with Roman history, and then my third A level was economic history with politics. So five out of my eight A level papers were history papers and I decided to sit the entrance exam for Cambridge, for St John's College, and I got an entrance award to study history there and started there in 1977. I did two years of history, and then I decided I wanted to teach, so I did two years of education. What also attracted me about the education Tripos was at the time it was the only Tripos course in Cambridge where you could do philosophy, psychology and sociology together, and you carried on with your main subject. So this turned out to be a very good preparation for HCI in that I'd actually studied the main disciplines, apart from computing. There was a course on computing and research methods, which I didn't do, because I was set on good results at the end of my third year and there was a strong chance that I would get a first-class degree, which I did get, and I didn't want to risk that by doing something difficult and risky like a computing course. I got a job teaching history and social studies in Derbyshire, in a place called Long Eaton, halfway between Derby and Nottingham, and the house I was living in, the landlord had a ZX81 computer that he left in the lounge because you had to plug it into the television. And I started using that and one day I was looking at it and Piers, the landlord – he was about the same age as me – just threw the manual at me and said, 'Oh, go on, I can see you want to use it'. So I started teaching myself how to use a ZX81.

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And by luck, someone moved into the house who was a Romanian defector who was working, he was a computer designer on the Plessey micro in Nottingham, so I started getting computer lessons off Sherburn, Sherburn Georgy [sp?]. And we had Commodore PETs in the school. There was also research machines, a larger computer, but that was in the science lab, so that was for the scientists to use. So I started writing programs for teaching history, I wrote an essay planning program, and I discovered there. So I was an interaction designer before I was doing HCI, and I found not to make the error messages too good. It had an animated error message when you made a mistake, and I saw one lad repeatedly making a mistake and I said, 'D'you know what you're doing?' He said, 'Oh no, look, I was only making mistakes so…', and it had this marvellous animated error coming up in letters on the screen.

And I also developed a program which had animated graphics and natural language input for teaching the history of medicine, but I ran out of memory, it was only 32k. But I wrote my own screen editor as well for the Commodore, so I could actually enter the graphics directly. So I'd got really interested in computer-assisted learning as it was called then, and applied for PhD places in education, and I got a place at Surrey with Lewis Elton, the comedian, Ben Elton's father, was one of the pioneers of computer-assisted learning in physics, originally at Battersea College that became the University of Surrey. So I had a place there, but it was the year that Sir Keith Joseph axed the Social Science Research Council and they weren't going to actually make any decisions about who was getting PhD funding until August. So as a back-up I applied for Masters courses in computing, and that was the year when universities like Heriot-Watt had responded to the Alvey Programme by putting on and getting funding for, from the Science and Engineering Research Council, Masters courses on advanced computing. So the deal at Heriot-Watt was, they gave me a university scholarship that they converted into a [incomp] studentship. I had to attend the courses in knowledge-based systems and pass the exams to be able to go on to the PhD, which I did. I wasn't allowed to complete the Masters, which was a shame, because I had 87% on the exams [laughs] and it would have been nice, nice to get a distinction in Masters as well. But anyway, that didn't happen. My supervisor was Graham Ritchie, he moved to AI in Edinburgh, he invited me over to visit people there and as someone with an empirical background in history and applied human science, I just didn't like the approach of the people in AI at all. They weren't interested in empirical work, they weren't interested in evaluation work, which, because I was wanting to model teacher pupil dialogues was really important to me. So instead I moved into the, what was then the Man Machine Interaction Group, the MMI Group, with Mike Norman who was the director, became the director, co-director of the Scottish HCI Centre with Jim Alty. And my second supervisor was Stuart Anderson, who taught me on the Masters course. So that's how I got into computer science and I got into HCI by developing, looking at developing software systems to support user interface programming. They were called user interface management systems and the idea was being, just as a database management system looks after the management of data for a program, a user interface management would look after the management of the user interface. And I did write some of those, but I actually, my thesis was on architecture and abstraction user interface management, it

was about specification notations and design architecture, software architectures. And there were many of us at the time in computer science in HCI where we thought it was important if you're doing HCI in a computer science department, it has to look like computing. So that was good having Stuart Anderson, who moved to Edinburgh University, as my second supervisor, because I was applying formal methods to specifying user interfaces for the dialogue. For the other parts of the user interface, the conceptual model, I developed an object-oriented notation, and for input, much lower-level ones. But we were, you know, clearly working within the research methods and practices of computer science.

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So that got me through, I was then given a job in the Scottish HCI Centre, Mike Norman moved to Hull, moved some of his Alvey grants, but clearly was not allowed to move half of the Scottish HCI Centre to Hull, so they brought in various people at Heriot-Watt to manage it. Jim Alty stayed on as co-director at the Strathclyde end. So it was there providing support for industry on HCI. So we helped a start-up with a program for integrating company accounts, because back then different parts of companies had different computers and all the accounts were on printout, so this piece of software would take the spool files from the printer, so it would actually, rather than send the job to the printer, it just kept the spool file, and then it basically could analyse the spool file. And I developed a graphical user interface that allowed you to specify what to do with the different lines of the accounts so that they could go into a database to be merged. And that was demonstrated in 1988 to Ken Clarke at the opening of the IT conference in Manchester that year. And we did some other work with industry, but with all the changes in management, I was actually offered a lectureship there with another guy so that we could take on the running of the HCI Centre. But that was, it was too early for me to do a job like that. So I knew people at Glasgow and asked if there were any postdoc jobs going there, and there was. This was a project with Bell-Northern Research, who were Nortel's research arm, and that was developing graphical user interfaces for switch maintenance, so maintaining telephone exchanges. And they were interested in graphical interfaces so they didn't have to translate massive amounts of user interface text on, you know, if they were selling telephone exchanges to Turkey, for example. So I worked in a small team

there with a fine artist, Tunde Copshott [sp?] who did the, he did all the icons and the graphics and I did the compositing in HyperCard, I wrote a HyperCard prototype. But then the icons were all in postscript and my colleague, Fraser Hamilton, he developed a prototyping system that was a literate system, so it had the documentation built into the prototype, and that would then put the icons up on the screen and do the layout, and I wrote a program that would actually take the dialogue specification. I developed a formalism called generative transition networks that would let you do straight sequence like in a graph, but also let you do inter-leaving as in a production system. So it would go all the way from stripped sequence to no sequence at all in a single formalism. It turned out to be a bit like statecharts that David Harel developed who became part of UML, the object-oriented specification language. So, I was working with industry again there and that project was very successful. And either the first or the second research assessment was coming up and I think Glasgow were keen to keep me on, so there was a lecturer's post created and I was interviewed for that with one other person, and I got that job. And that's when I became a computer science lecturer. So, do you want me to stop now, or shall I carry on?

[00:13:46]

Okay, so let's go back a little bit and then we can continue from this moment on. First, can you describe your parents?

Yes. So my, I was from a working class family, my mother was a housewife, she did later work once we were at school, she worked in a school as an assistant with school lunches and also domestic tasks and cleaning. My father was a chargehand, which is a blue collar manager, and he started off- so he was in the Navy in the war on minesweepers, then he was in the Forestry Commission. And then he got a job in a company that made leather drive belts, Angus's, and they also made fire equipment. And that's when he met my mother, she was working there. And then he got a job at Clarke Chapman's, the marine engineers in Gateshead. They made deck gear, capstans, windlasses, cranes, for ships, so shipbuilding was very big still on Tyneside, so all the ships that were being made there, they all needed their deck gear for cargo handling and tying up and manoeuvring in ports, the capstans and the winches. And he became chargehand in charge of dispatch. So these days he'd be a production

manager. He never went onto salary, he didn't ever want to not be paid for overtime, his view was, if they need me, they'll pay me. And he wouldn't have- they wanted to put a phone in the house as well, he said, no, if they want me, they can come and get me, so they'd have to send out one of the director's chauffeur-driven cars to pick him up if they needed him at the weekend. So anyway, he basically was responsible for getting things out of the door on time, which because, you know, if it was a replacement winch or capstan, that ship would be at sea and the plan would be that ship would be docking at Southampton at a certain time and they'd get the winch down to it, or the capstan, or the spare part or whatever, but of course shipping schedules change, so sometimes something would have to be speeded up. So without any computers he knew where things were in the factory, who was making the parts, who the fitter was, and he'd work with the foreman basically to get things out on time. And he also then took over transport as well, because clearly, just getting it to the factory gate wasn't enough and once the guy who was in charge of transport stepped down… so he was a, you know, technically a blue collar worker all his life, but he was doing the jobs these days that graduates would be doing. And both my mother and father left school at fourteen, they both passed the grammar school exams but they couldn't, they didn't feel their families could afford to send them. In my father's case, he was the youngest and his two older sisters had left school at twelve and they were in service and they offered to pay, because of the expense of the uniform and the books. So there were no fees, because they had scholarships, but my father didn't want to be a financial burden on the family and my mother was older, there was no way they could have afforded to let her go to grammar school, so I think they were both very keen for my brother and I to have an education. Yeah.

Okay, so let's go back to your school years. What were the influences on you on this time?

I think I responded to good teachers and the Classics teaching was good, Latin and Greek, so I did Greek in my third year, and then I decided to keep it on, up to O level, which meant that I dropped chemistry. And I was in the top maths set as well, so I only did A/O mathematics, I only did the maths exam for seventeen year olds. So yeah, there were a lot of very good teachers at the Royal Grammar School and I tended to respond to those. And I just was interested in different things. I had very

inconsistent exam results at sixteen; I got top grades in physics, geography and Latin, not in history, and- because I very much did what I wanted to, and generally that's been the pattern in my career, that I do things that interest me. I don't do things because I think other people- I don't do them because of status, I don't do them because of remuneration. And it was the same at school, if something interested me, which is why I ended up doing so much history at A level, because I really got interested in history. I did sports as well, I did gymnastics and athletics. And again, that was the gymnastics coach who was, you know, I got on very well with him. He became the Scottish national coach, so when I lived in Edinburgh I used to train alongside the Scottish junior team. But yeah, I think it was just that environment, it was a very academic environment and the teaching was generally, not always to a high standard, you know, the teachers really understood what they were teaching, were really enthusiastic and, you know, some of them, like Latin, it was years later that I realised just how good it was. In some ways at sixteen, seventeen, you were too young to be reading Horace and Lucretius and Seneca and people like, you know, but it stayed with me, you know, you can go back and read them when you're older.

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What about your Cambridge years?

They were great, I really enjoyed those. So I did two years of history and so nowhere near a computer yet, and during my second year I decided that I really wanted to be a teacher. I think, you know, having enjoyed being at school myself, I could see the value of a teaching career, so I changed. So Cambridge, the university is not in control of who does what, the colleges are. So, at the time there were only three degrees in Cambridge where you needed permission to change, and that was medicine, veterinary science and education, because they had professional components to them and they couldn't admit someone to the course who clearly wouldn't be able to get through the professional part. So I was interviewed for education and got admitted there. It was only the second year of the education Tripos, the education course at Cambridge. It was just a final two-year Part II and that had the postgraduate teaching certificate integrated into it. So I very much enjoyed history and I very much enjoyed education as well. And I was on the gymnastics

team, so that gave me a distraction away from work. But I really liked doing philosophy, psychology and sociology together. You know, it was very applied, it was in the context of education. But that really gave me a great foundation for when I came to do HCI.

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So when did you join the British community in HCI?

I think in a way the minute I was in the Scottish HCI Centre, because we were networking very quickly. So one of the projects running at Heriot-Watt before Mike Norman left was the Adaptive Intelligence Dialogues project and because of my work on specification languages, dialogue specification, I was invited down to one of their project meetings.

What year was this?

That would have been 1984, or maybe 1985, and it was the first time I'd flown – I flew from Edinburgh to Stansted. I'd never flown before, so that was great, and I was picked up at the airport at Stansted and we had a two-day meeting at STC and I was staying in a hotel there. So I thought, this is good. [laughs] A nice way to work. So I met the people on the AID project there, people like Dermott Brown from Data Logic, people from STC, I can't remember their names any more. And then the first- we also visited York, the Five Man Project. So Stuart Anderson, myself and some of the other researchers went down to discuss formal methods in HCI with Michael Harrison, Harold Thimbleby, Alan Dix. And we… and then the first British conference was 1985, so I submitted a paper on dialogue specification on transition network systems. It was a critique of existing user interface management systems, because they'd not done a good job in terms of formal methods and the mathematical side of the dialogue specification languages they were writing, there were all sorts of flaws in them. So that was quite a critical paper. But that was, you know, that's the background I brought with me from humanities, that, you know, they are critical disciplines and if something doesn't make sense and doesn't add up, you say so. Actually, it turns out that STEM disciplines tend to be quite conservative and there's a

lot of loyalty within the discipline and rocking the boat is not seen as a good thing in a lot of STEM disciplines, but with my humanities background it was already baked into me. So that was my first paper and that's when I met many people for the first time.

So if you have to describe the evolution of the British HCI community and its main centres, both from an academic perspective and an industry perspective, what would you say are the main centres and milestones that…

So the Alvey Programme was very important in providing funding for man-machine interfaces and they established three HCI centres: one in Scotland; one in the Midlands; one in London, and they were, you know, some long-standing HCI groups, the ones that really began the discipline in the UK. So there was HUSAT in Loughborough – Human Sciences and Advanced Technology – so they were within the ergonomics community. There was the UCL Ergonomics Unit, so that was John Long leading that at UCL, and at Loughborough Brian Shackel was the professor in charge, but there were many other people there: Leela Damodoran, Ken Eason, junior people, people more my age like Martin Maguire. Also in the Midlands centre was Leicester Polytechnic, that Ernest Edmonds was in, and then he subsequently moved to Loughborough. So Loughborough and Leicester were key centres and Ernest's had done work on user interface management systems as well, so he was a key researcher for my PhD, Ernest's work. London UCL was ergonomics and their partner was Queen Mary College, as it was then, with Steve Cook, Peter Johnson. Peter Johnson became a very central figure in British HCI. He was a psychologist, Steve Cook was a computer scientist, focussed on object-oriented programming. So, you know, unsurprisingly, the universities that had a strong HCI element to them, so Strathclyde with Jim Alty, Mike Norman at Heriot-Watt in Scotland, and, as I said, UCL, QMW, they were the key centres. There were other ones: Essex in engineering, and Southampton engineering, Alan Newell was at Southampton, Brian Gaines was at Essex and Ian someone, that Harold Thimbleby would have mentioned. Ian Witten, that was it. So there were good groups elsewhere.

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Huddersfield Polytechnic, where Mike Norman had moved from to Heriot-Watt, Linda Macaulay was there. So they were the main centres. And the thing about the Alvey Programme is that from the outset it had academics, universities and companies working together. So it was very clear from the early days where the HCI groups were in industry. They were in IBM at Hursley Park, they had originally been in Peterborough at the European Research Centre, but my understanding is IBM had difficulty recruiting people to work in Peterlee in County Durham. And when that closed some of them moved to Hursley, others went to jobs at Newcastle University. So IBM, ICL, Andrew Hutt led the group there, STC in Harlow, their labs had an HCI group, Logica in Cambridge had an HCI group, Data Logic who did a lot of software for dealing systems in the City, they did very early work there. IBM was doing work with the military. So later on in the nineties they did all the user testing for the military air traffic control centre at Boulmer, which had a budget of a million pounds for the user testing, because it wasn't just the actual user test people, it was the planes in the air and the pilots and the rest. So, yeah. So that's the sort of sketch of who was involved. I think that was mostly it. There was some psychology work in Cardiff, which is where Yvonne Rogers did her PhD, with Dylan Jones, but that was very much psychology. So that was at the outset, and then Glasgow came on stream pretty quickly with Phil Gray, and then when Steve Draper joined, that formed a nucleus as well. But I think, I think in the early days that was pretty much it. Certainly for the Alvey Programmes, but then once the British HCI Group ran their first conference in Norwich in 1985, that's when you could really see the start of the community there. So I can't remember where Alistair Sutcliffe was originally. He was at City for a while, but I don't know where he was before that. Yeah.

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And what about the BCS HCI group?

So, I don't fully know how it was started, it was started in 1983 or 1984 and they'd had a meetings secretary but that hadn't worked out, so Mike Dolman, my PhD supervisor, he knew Nigel Bevan and others and said they were looking for a meetings secretary, it might be something that I might be interested in. So I met Nigel and others at the conference, so that was my first HCI conference and immediately,

I'm, you know, talking to people on the committee. So Peter Johnson was on the committee, Steve Payne was on the committee, Nigel Bevan, Diane Murray, Rachel Benedyk, who's still at UCLIC. So it was a very successful conference, it was a very vibrant community and there were quite a few of us from the Scottish HCI Centre had papers in that conference. I was in the same session as Alan Dix and Phil Gray, so yeah, I got to meet people very quickly. So I think the British… so at that point they had the newsletter and they had the conference, and I established a meetings programme of six meetings a year: five in London at the Charing Cross Hotel, and then one other one elsewhere. So we've held meetings in Edinburgh, in York… I can't think of anywhere else where we held meetings. But yeah, they really brought the community together, particularly the London meetings because, you know, a lot of people could get to them. So in terms of industry, Jonathan Earthy. So I think one of the ways to see where people were in industry is to look at the standards. So Tom Stewart and Nigel Bevan were involved in ISO standards for HCI, like 9241, and Jonathan Earthy was on the standards group. So was Susan Harker at Loughborough, Tom Stewart. So it was through meetings and communications, and working within the British Computer Society, working with the BCS was a lot slower. Jonathan Earthy tried to get UX qualifications within the British Computer Society scheme, but again, it was taking the certification scheme into areas like psychology and sociology that I think was just too far away from core computing and software engineering and IT for them. So that was something that didn't succeed.

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Can you describe a meeting? So how did it happen, how many people were there, what was the organisation of it?

So we'd agree topics and I'd take suggestions for speakers from the committee, and also take suggestions from people in the Scottish HCI Centre. So we'd put a programme together, they would send their material to me – it was all on paper in those days, so the actual programme for the meeting, the documentation, was a fairly ugly cut and paste job. I made footers with the BCS logo on, but it was a cut and paste job with hand-numbered pages. And we'd have six to eight speakers, introductory talk. Each meeting would have a chair who'd do the introduction and

chair it. And there'd be three or four talks before lunch, then we'd have lunch and then some others after lunch and we'd perhaps have a drink afterwards. But I was flying from Edinburgh so I couldn't stay too long afterwards. But there'd be, you know, people would stay behind and socialise after the meetings. People paid on the door, they either brought a cheque from work or wrote a cheque, or they paid cash and got a receipt. And two PhD students: Sara Jones, who's at City University now, was one of my doorkeepers, and the other guy's at Southampton psychology, I've forgotten his name now. But they were great. And then Russell Winder, the treasurer, would take the money to bank it. [laughs] Yeah, they were great because we covered a lot of topics. We had- and we would run joint meetings, we ran a joint meeting with the Office Automation Group on job design, and that brought in people from outside the HCI community, so, you know, work relations, think-tanks and charities, they were speaking. Office automation, again, there was someone from Plessey came to talk about that. Someone from Strathclyde council talked about how they'd introduced word processing and how they'd moved the typing pool off mechanical typewriters onto word processing and really good examples of change management. This is like 1986/1987. We had a meeting on graphic design, in interface design. So those meetings were very good in actually scoping out the disciplinary space and I ran those meetings for three years. The one in York I think was hosted by Rowntrees. One of my friends from St John's College was in operational research so he was working on computer systems there.

Did you ever have people from abroad?

Yes, we had Jakob Nielsen in 1987. He was visiting Britain and he'd decided to visit Scotland as well, he came to the Scottish HCI Centre. And Jakob used to write trip reports and publish those in the SIGCHI bulletin and he wrote a very nice one saying he hadn't thought of Scotland as being somewhere where there was any HCI work and he was very pleased. So yeah, certainly Jackob Nielsen, because he was over here anyway, we invited him to speak at the meeting in London. And we did have people- so they were speakers, we did have attendees as well, people coming over. You know, because it was fairly easy to get over from Paris or Amsterdam. Not many, but I can remember some people coming from abroad.

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So if I ask you to describe Brian Shackel?

So I first met Brian in 1986, he was the keynote speaker at the HCI conference in York and he was much older than me, he'd done Classics at Cambridge. So we were both Cambridge graduates, so we had something in common to talk about. He was a very important person in the way that people were in those days. He acted the part as the grandfather of computer ergonomics. You know, by then he was already, so by 1986 I think he'd already been working in the field over two decades. So, you know, he's one of these people who had a lot to say and expected you to listen to him. But I did get to know him quite well and we worked together on the INTERACT conference in 1990 and on the INTERCHI conference. My memories on INTERACT is just how fair-minded he was. He didn't trust the programme committee or the reviewers to necessarily get it right, and we looked at the borderline papers. I remember him pulling out the borderline papers and they were re-reviewed, and looking at what the reviewers were saying. So one of those papers was by Ted Selker, and it was on the IBM joystick for the laptop. And that had been rejected because the sample size was too small, which just was, you know, a ridiculous reason for what was a prototype. It had been tested enough, it had good enough results, and as we all knew, it was quite clear afterwards, the thing really worked, it was really successful. But I do remember Brian very closely scrutinising the borderline papers and pulling them out, and we, you know, with Brian's leadership there and with the people in the room from the International Programme Committee, that really did improve the programme for INTERACT 90, which was in Cambridge, at Robinson College. And, as I said, I worked with him on INTERACT and I worked with him on INTERCHI, which was joint with ACM CHI in Amsterdam. We'd often travel back to the airport together from the planning meetings at the RAI Centre. So I got to know him reasonably well. But he largely remained within the ergonomics society community, so people like Rachel Benedyk worked more closely within the community. I think that was, yeah, the only time was at conferences, was when he was a keynote at HCI 86 and the INTERACT conferences because he led TC13, so that was his baby.

What about Jim Alty?

So Jim was co-director of the Scottish HCI Centre; very affable, very cheerful, bit of a joker. I really took to Jim, he was very straightforward, very enthusiastic. A great speaker, he spoke with great enthusiasm. Initially about his work on path algebras, which again, I drew on extensively in my PhD. And then he became interested in multimedia very early on, because he's a very talented musician. So you had, you know, at Loughborough you had Jim on music and Ernest on visual art working alongside each other. And he was a real pioneer of multimedia research.

What about Ernest Edmonds?

So Ernest, I remember being at the conferences, but he came, we invited him to speak to the Scottish HCI Centre and I didn't know anything about his computer artwork at the time and he gave a talk very much on where HCI was and what it had achieved, but his sense that we really needed to embrace creative practice more, which in 1987, for someone who was trying desperately hard to look like a proper computer scientist just went right over my head, and it wasn't until I'd been in design in Northumbria two decades later, two and a half decades later, that finally I began to understand what direction Ernest wanted to go in. But I think because he didn't have a background in design research, he couldn't articulate what he was saying. But to be honest then, research into design, the likes of Nigel Cross was only getting going in the eighties. So I think to be fair to Ernest, if he'd gone to read stuff, design, it would be the design methods movement from the sixties and the seventies, which we all know failed. But to the credit of everyone involved there, like John Chris Jones and Chris Alexander, they said that. Unlike engineering design, where even today people are still trying to manage a linear process and make people do things at certain times and, you know, it's completely nonsense, that's not how design work works. You know, you follow the direction of ideas, you don't follow a project plan.

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What about Phil Bernard?

So Phil was at the APU, a psychologist. I had Phil, I think we had a meeting on guidelines, we did, and I had Phil speaking on that. And he took a very hard-line psychology approach, basically saying that guidelines documents are just impossible for anyone to use. So there were some guidelines developed for the American Air Force at MITRE by Smith and Mosier – it's online now – and I actually wrote in and asked for a copy and it was sent all the way from America. And it's about five – I still have it – it's about five centimetres wide, very well structured. And, you know, Phil claimed that no one could take that in. Well, as a historian I had, you know, I was used to reading through large documents and taking out what was really important. I remember, you know, with the dotcom crash, one of the problems was that all these abandoned shopping carts online, you know, where something like only ten per cent of shopping carts were actually making it through the checkout. If those people designing those shopping cart interfaces had read Smith and Mosier they would have known how to design forms properly in a way that wouldn't have led to a failure. So, so that was something we disagreed on, but he again was very influential. Within the AMODEUS project, so there's a European ESPRIT framework project, two of them: AMODEUS and AMODEUS, where they were looking at modelling, and he made some really strong contributions to looking at the role of psychology and design there. So yeah, he's a very, very eminent psychologist and, who, you know, pulled out of HCI like many psychologists did in the nineties, because either the psychology departments didn't want those applied people, they wanted people doing proper psychology, or the funding shifted. But there was a big rise of psychologists in HCI in the eighties and a very rapid decline again. So people like Steve Payne carried on doing HCI work at Cardiff, but alongside very basic work on memory. So he could afford to submit HCI papers for the research assessment because he had really strong psychology ones alongside them.

And what about John Long?

Oh, John was a real character as well. He was always in the bar [laughs] at HCI conferences, with Dan Diaper and others, so striking up conversations with John was always easy. But again, he was a hard-line psychologist as well, in terms. And he carried on trying to formalise things when other people had stopped. He was interested in processors. So the thing about people, if you believe that design and

development's a linear process in stages, you have to get from one stage to the next, and the language that gets used in engineering design is very telling. They want to talk of how you generate outputs from… that the inputs into a stage then generate the output. So they use words like generate, translate. It's this very mechanical mathematical model. It's a sausage machine that you put things in and you get things out. The problem is that no one's ever described what happens in the boxes to do that and the ISO standard 9241 was revised, the 9241 part 210, which is the process standard, was revised in 2019. And they actually, one of the things they did was they put example inputs and outputs on the arrows, for which no methods exist that will take those inputs and produce those outputs. And we know that what happens in creative design work is that you've got things side by side. You're thinking about the design, you're thinking about what you know about users, you're thinking what you know about, you know, you're thinking in terms of product strategy, and it's, as Charles Eames said, it's about making the connections. So there's no mechanical procedure for turning inputs into outputs. Everything's an input and none of them are relevant until you manage to connect them in some way. And that's always been a problem with user-centred design, the assumption that if you study users and tasks first, that you will then be able to say what the requirements are and you'll be then able to design it, but that's just, no, people design.

[00:43:37]

And what about Alan Dix and formal methods?

So Alan was a PhD student at the same time as me, we presented in the same session as each other in the first conference in 1985, Alan was at Cambridge at the same time as me doing mathematics – I never met him at the time, he was quite a star, he did his maths degree in two years and then did his Part III in his final year. And then he worked as a statistician, I found this all out, because Alan was in the IFIP working group with me on user-interface engineering, so again, I spent quite a lot of time with Alan on trips and travelling. Full of energy, very dynamic, very enthusiastic. And like people at York and people at Heriot-Watt in the early days, and Loughborough as well, trying to apply formal methods to interface design so you could prove certain things correct and, you know, one of the things that Harold worked on was proving

that you didn't get to dead ends. Jim Alty had done this with path algebra, so some of that work that went onto the CHI+MED project that Swansea and UCL were involved in, is really worthwhile, that you really, you know, for things like medical equipment you want to be able to prove that it's not going to lead to really serious errors and problems that have killed people, you know. And the problem is that it's very hard to prove that a medical device has been involved in killing someone, because the medics don't want to own up to what happened, because what often happens is that a system design problem in an enquiry becomes human error, that even though the system is clearly flawed and poorly designed, you know, apart from things like Three Mile Island and the Therac-25 radiation oncology machine, the machine rarely gets the blame. So no, I think that work that was begun at York that Harold's continued is very important, but, you know, it's been difficult to get it to deliver in practice. I think the research work is really good, and I think the problem there again, the difficulty there is that you have to assume a certain way of working in design and a certain way of following a process for that to work. And this is what John Chris Jones did in the sixties with design methods. He was an ergon… he was a Cambridge engineer, went to work at AEG, got into ergonomics, was doing all the ergonomic study for the things that AEG were making, but the product designers weren't, and engineering designers were not making use of it. So Chris Jones, John Chris Jones redesigned the whole engineering design process at AEG to make them use his ergonomic information at the right time. Well, you just can't do that, and that's, I think the problem in design is, when any area claims to be the centre of the design, like the human or the user, you know, sustainability, whatever, you lose balance and you simply cannot have one factor in design taking over. Which is why I prefer the word human factors, human factors are some of the factors in design and they're very important ones, but they're not the only factors in design. And I think that's remained a difficulty within the HCI community that they think if we just study the users properly and do user testing properly, everything will be okay. And it's not. You know, until you actually understand design work, you will continue to come up with research that just can't be applied because it doesn't match the way people work. And saying that they're working the wrong way or they're stupid or they're negligent or they don't care is not helpful at all. So I think we've still got some problems. I think the expansion of HCI into interaction design and the expansion of interaction design into HCI the other way, with people like Bill Gaver, who's at Northumbria now, has

really improved our chances of making much better use of the research inputs that you have in user-centred design and making them effective. So formal methods. And Alan of course has shifted as well. Alan is very, very versatile and very eclectic, I would find it impossible to summarise all the things he's done research on, you know. Each time you hear him speak he's doing something new.

[00:48:03]

So let's go back to the story of your career. We arrived to the point where you effectively became a computer scientist.

Yeah. So yes, so I started off, I needed another string to my bow so I taught software engineering at Glasgow and taught second year programming as well.

What year was this?

So in 1989 I was, became a lecturer and in my first term I taught second year HCI and graphics, it was just a ten-lecture module: five of graphics, five of HCI. So originally the research group at Glasgow was the Graphics and HCI group, and then for about a year it was renamed to the Glasgow University Consortium on Computer-Human Interaction, or GUCCHI [laughs], but that was just too hard, so we became just the Glasgow Interactive Systems Thingy – we never decided what the 'T' was for. *Truc*, in French, was Phil Gray's suggestion. So in my first- oh, and then I taught the graphics course on the Masters, the conversion course, so I was teaching people who'd done three weeks programming, I then had to teach them some graphics programming, so that was a bit tricky. So the only HCI in my first year was those five lectures with the second years. But they'd redesigned the curriculum and they'd introduced HCI into the third year from 1990, so Phil Gray and I taught that, which meant that I dropped- I carried on teaching software, second year software engineering, but they moved me from the A stream that had all the hardcore computer scientists, to the B stream that had students, like Susan Spence who went on to do history and computing. But some of the students from the B stream, like Fraser Hamilton, who worked with Helen Petrie, actually went on to single honours. But there was more HCI to teach. So I came off the Masters graphics course, which was a

good thing, and – for everyone – and I taught, we started third year HCI with Phil. And I can't remember whether it was '91 or '92, it might have been '92, maybe we waited a year, but there was a very good response to the third year HCI. So in Scotland it's a four-year course. So the American university system is modelled on the Scottish one, you know, freshman, sophomore. At Glasgow they were called ordinary and high ordinary, and then they had junior and senior years, junior and senior honours in Glasgow and Edinburgh and the other old universities.

[00:50:41]

So there was nothing to go on to at third year and the fourth year curriculum at the time was great at Glasgow. They had, you only had to do three forty-credit modules, forty-hour modules. So there were two lectures a week across both their semesters. And one of the things there was to prepare students better for PhDs. So there were no MRes's then, so what that meant was a Glasgow student could pretty much go straight into a PhD out of the fourth year modules. The first cohort we had through there, Steven Clarke is now a principal UX guy at Microsoft working on visual studio. Fraser Hamilton went on to do accessibility work with Helen Petrie. Susan Spence went on to do cloud computing work with Hewlett Packard, so she did a more traditional systems engineering PhD. But that was a small group of students, and I remember one of them in the student questionnaire saying that HCI 4 has by far the heaviest workload of any final year module, but if they gave us more we'd do more. So we established the first continuous HCI curriculum across all three years. The first year was information engineering where they covered things like word processing and spreadsheets, but that had some HCI in it as well. And then finally we, for a short while we had an advanced information systems Masters where I taught design theory into, and that was in '95/96. And then as I picked up PhD students, Steven Clarke and Darryn Lavery, the workload for PhD supervision was very generous. A lot of students wanted to do final year projects with me, so my teaching, eventually my teaching was only HCI 3 and HCI 4. And I team-taught that with Phil Gray and others as well, so from having had a very first year of teaching across a lot of, you know, a fair range of computing subjects, and narrowing down to become an HCI specialist. And I was there until 1994.

[00:52:44]

And then what happened?

So I had a, what would now be a Marie Curie Fellowship to go to Grenoble. My wife was a doctor in Edinburgh, she'd just qualified, and once you qualify you have to get a consultant's post, you can't stay in your training post forever. So she had to keep applying for jobs until we went off to Grenoble for two years. We had two young children and eventually a job came up at the first hospital she'd worked in, in North Shields near Newcastle, which she went for, knowing that if she didn't get it she'd be having two years in Grenoble with the kids. And she got it. So we moved for her job and I went part-time at Glasgow until 1996, I went down to, I was going to be 25%, I think – have I got this right? Yeah. But then the new principal changed the rules, you could only be part-time in units of 10%, so I went up to 30%. So I carried on teaching HCI for, I would go up there most weeks two days, stay overnight at a friend's apartment, finishing off my PhD supervision and research as well. So Glasgow had really focussed on getting the top rating in the research assessment in '96 and they did get a five star. They also got an excellent in teaching, so they were the only computer department with top ratings in teaching and research. So I worked part-time, I looked after the children one day a week on the Friday, and that meant we could have a nanny four days a week doing ten-hour days, but we didn't want a nanny doing a fifty-hour week with us. And that gave me the flexibility to carry on doing the work at Glasgow. I then got a job in industry in 1995, that was, they had a couple of research associate jobs advertised in two ESPRIT projects, they'd got two framework 4 projects on language engineering and I emailed the guy, the project manager, saying look, I'm working part-time at the moment, I said, I'm happy to come in and work on the projects part-time until you manage to recruit. And that was the arrangement and they did recruit researchers to the projects, but they kept me on part-time. I was 50%. So I was 30% in Glasgow, 50% at MARI, and that sort of filled up my time till '96. And then I got a phone call from my father one day and he said, 'Gilbert, there's a job'. I said, 'Where?' He said, 'Oh, Northumbria University, they want a lecturer'. So he'd been reading the local paper. I said, 'Oh, I'll have a look at that, Dad'. And then the next day in the post first class, he'd cut the advert out. So I think he wanted me to get a proper job and stop looking after kids and things like that. So I went to

see them at Northumbria in computing and said, look, I can't work fulltime, I've got childcare responsibilities, could you do this part-time. So they withdrew the advert and re-advertised it part-time. So for a little while I worked one day a week there. So in June 1996 I was 100% on payroll, and looking after the kids one day a week, and doing consultancy in design work. So I did a lot of freelance design work, I did a lot of work for the European Commission during that period. And it was interesting, there was another guy, who sadly his wife had died of cancer, and he had similar, you know, he had more childcare responsibilities than I did, but he found that reviewing and monitoring work with the European… that worked very well because he could actually do intense bits of work where the grandparents looked after the kids. So it wasn't actually that unusual to be looking after the kids and in Brussels the next week, being the lead evaluator on a programme. So that was good, it was good working in, I really enjoyed working in industry. Because you went in, I went in on the Monday knowing what I had to do, did it, same on Tuesday, and went home knowing, you know, I'd have a half-day on emails and working at home.

[00:57:00]

Okay. So at Northumbria I set up an HCI group called the CADENCE Group, for Context, Analysis, Design and Evaluation of Novel Computing Environments. My two PhD students at Glasgow, who I was still finishing off supervising: Darryn Lavery and Steven Clarke, who both went to work at Microsoft, that really got me into user-centred design. Steven was looking at contextual design and explicitly how you could show explicit links between your contextual research and your design. So he was using my design notations and some other ones to relate those, because the claim on user-centred design is if you study users and tasks then it'll tell you how to design. Well, it was quite clear from Steven's PhD, was that the direct links were not really HCI ones, they were software engineering ones that, you know, the objects in the domain became the objects in the system. So, you know, on a mobile phone, your contacts app, well yes, people have got first names, surnames, different phone… you know, they're no-brainers, you know. Although contacts, you know, there are certain aspects of contacts databases are not straightforward, and then the more complicated stuff was, with, through argumentation that Rittel and, Horst Rittel came up with after the 'wicked problems' paper. So that meant that I was doing work in, you know, I

had a student working in contextual research, and another one, Darryn was working on evaluation methods, so that basically took me away from that craft computing core of interaction design into context and evaluation. And Susan Turner, who I'd worked with at MARI and she'd also, you know, at Loughborough, she'd been at HUSAT, she'd been a researcher at HUSAT, then a researcher at MARI, working on similar projects to me. And then she was also at Northumbria, so that became the core of an HCI group there that grew to almost ten people, just in the year I was there. Lydd Hall [sp?] joined us as well from Spain, and I got a readership at- that was sort of part of the deal, when they looked at my CV said, well look, we'll give you a lecturer post and you really need to put straight in for a promotion to Reader. Which I got, and at just about that time Sunderland University had decided that they really needed to improve their research performance after the 1996 REF – well, Research Assessment. So they advertised for researcher Chairs, and they had one in Information Systems. And John Tait, who was on one of the projects with MARI, one of the language projects, University of Sunderland was a partner in that, he asked me if I was interested in applying. So I got back into academic computing, first through my father [laughs] reading the local newspaper, because I wasn't looking for another academic post, I was quite happy working at MARI. And then I got invited to apply for a Chair. So I went for a chat with John at Sunderland, had a look round, lovely, brilliant new building there. And was interviewed, and I suppose, that was 1996, it's okay to say here, I went to the interview at the vice-chancellor's office at Sunderland, Anne Wright was chancellor at the time, as I was going to sit down outside, who should come out the door as their external assessor for Chairs, but Jim Alty. [laughs] And I go, 'Oh, hello Jim!' And he goes, 'Shh, shh, shh'. [laughs] And he went, there was only – just like Glasgow – there was only one other candidate. And, got the job.

[01:00:40]

So that took me to Sunderland, where we started pulling together an HCI group there. So Sharon McDonald was recruited as a research lecturer. She's now with the government digital service, but she was Professor of HCI in Sunderland before she left. And actually that was a broader group, that wasn't just… that was really pulling together research across HCI information systems and really trying to get a research culture going in a former polytechnic. But, the deputy vice-chancellor really thought

computing should be doing something with multimedia. And he was on to the dean saying, what are you doing about multimedia. Didn't get very far until eventually the dean said, 'Oh, we can't really do anything, we don't know what to do, we don't know where the companies are, we don't know who's doing what, we haven't got time to do the research'. So the deputy vice-chancellor just gave them several thousand pounds to do the research, so they commissioned some market research to look at where the digital media companies were in the north-east and what they were interested in and what sort of collaboration they'd like. And the first meeting of those was just when I'd started at Sunderland. I started a day a week first and I was just about to go out to Microsoft to visit the office usability team the next day, so I was interested as the new professor in HCI and, you know, he's off to Microsoft tomorrow, you know, look who we've got. And I had to leave that meeting early because I was flying out to Seattle the next day, and they decided afterwards that they would like something like a member association, but the proposal of calling it a multimedia club they didn't like and they didn't really like multimedia either, they wanted digital media. So I then got charged with getting the funding for this. And when it was when Sunderland was starting to use, apply for ERDF – European Regional Development Fund – money to develop their relationships with industry. And they've got a fantastic track record there now, particularly with automotive engineering. But anyway, we got the funding for a digital media network, a networking project with regional companies, which I saw as a technology transfer project. But at about the same time as I started as a professor, a guy called Ed Brown, who'd been one of the IT managers at Sizewell, a physicist, a local Geordie lad, he was at government office north-east, and it's when Peter Mandelson became really keen on clustering as an economic development strategy. So he got interested in what I was doing with this proposal. So did Tom Cosh, the head of Economic Development from Newcastle council, and they both got me interested in clustering and I sort of, they reframed what that project was about. And it was a membership organisation anyway, so, you know, it was appropriate that we did things that were compatible with the funding that were really to their benefit. And that really, and that's where my, that's the origins of my design work, you know. So when we were naming it and coming up with the logo, one of the guys on the board, Peter Bullock, said, what's the value proposition? I'd never heard that term before. And that got me really, that really got me rethinking what we were doing in user-centred design. But

anyway, we had a series of these projects, we ended up with a big regional centre of excellence funded by the DTI and Europe, called CODEWORKS. So I pulled back from the leadership at that point, I didn't want to be chief exec of an organisation like that, but I directed a project across four north-eastern universities doing technology support for digital companies. So Alan Woolrych, who sadly died a few years ago, he would work, he would do the user testing and evaluation work for companies, and either on a product they were developing, or if they were pitching for work, he would actually, you know, sub-contract the usability work and, allowing them to bid for work they couldn't otherwise go for. And the work was subsidised as well, it was free, so the usability work that Alan would do and all the work that the four universities were doing in support of companies in the north-east was free. And there were some things they made contributions for.

[01:05:09]

So I mean the key thing at Sunderland was I then had a group of probably getting on for twenty who were combining teaching, research and reach out, working with industry. And that was great because we could do really good applied research. Not necessarily as part of the project, but we could get enough examples and we could test things out. So that was a great few years. I mean it was very busy because I was having to do breakfast networking events and evening networking events. But that was very important for really giving a boost to the digital sector in the north-east and it's the top centre for start-ups outside of London. A lot of start-ups move to Newcastle, or the area, because it's a much better quality of life, the graduate supply is really good. So yeah, so that was, you know, my dad got me the job at Northumbria, the deputy vice-chancellor got me into doing industrial networking projects. And through that someone nominated me for a NESTA Fellowship, which I got in 2004. And beginning of 2004, so that was great timing. So the CODEWORKS project with the four universities was ending in 2005, so I timed my NESTA Fellowship to start towards the end of 2004, because those regional projects, the various projects had me bought out 80%, so I was only supervising research students and doing research, I was doing no teaching during those projects. I'd done some multimedia teaching, interaction design teaching and e-commerce, user interface design teaching, before these projects really took off. But then I just didn't teach for a

few years. I also chaired the CHI conference during that period. So that really shifted things. So once I was taken forward to apply for the NESTA Fellowship, and it's very different to research funding, you get a programme manager whose job it is to make sure you get the funding, you know. So you fill in the forms, they'd say, I know you've put 'yes' here, but – and I know why you've put yes – but it's better if you put no. So I ended up with a NESTA Fellowship. Bought me out 40% and with a pot of money that I could spend on anything, including books, and that allowed me to, you know, the status of a NESTA Fellowship. So that's the National Endowment for Science, Technology and the Arts, and it was very much about filling this creative space between science and art. I could pretty much travel wherever I wanted to, talk to whoever I wanted to, so I went to Philips Design, talked to Steven Kyffin there and got an idea of how Philips were managing their design processes. And soon after that the research was running down at Sunderland when the deputy vice-chancellor changed, and I started applying for other jobs, and then Pam Briggs, who'd been at Northumbria all the time, she joined psychology while I was, around the time I was in computing. She said, oh, just hang on, there's going to be a load of research posts coming up. So they had this Strategic Research Innovation Fund, something like that, or Strategic Innovation Fund to finance professors at Northumbria to really start developing the research. So that took me from the design end of computing to the computing end of design and that was very, very educational. Because I'd taught games design at Sunderland as well, so when my NESTA funding ran out I started teaching also, I was teaching on the games design course, did some teaching on the research methods course as well. And ever since the Masters course where I taught a design theory component at Glasgow I'd, for whatever reason, I'd just naturally gone for a studio practice. I did do art at school, I did an extra art exam in the sixth form when I was seventeen, but for some reason that just seemed to be the right way to do it and, you know, we were just doing crits and things like that in the computing department, because we couldn't see any other way of teaching design. So I turned up at Northumbria thinking I knew about it. Also, the other thing was my mentor for my NESTA Fellowship was Gillian Crampton Smith, and because she was meant to be moving back to England, but then she got the job in Venice, and so I used to have my mentoring meetings in Venice with Gillian, and the first time she, I see her coming over the bridge near the hotel where I was staying, and there's this guy with her. She said, 'Oh, this is my husband Philip, is it okay if he sits in, you know, he's really

interested in your fellowship'. And of course this is Phil Taylor, former professor at the Bartlett School of Architecture. So I got two mentors for the price of one and I, gosh I learnt so much from them, because I thought I understood design, but gosh, you know, I just learnt a lot. And then I learnt even more.

[01:10:15]

That was a really good bridge because they, I think there were a lot of things that Gillian and Phil said that I half understood and didn't really accept or get, but once I was in that context of studio-based teaching in Northumbria, a lot of the things that Gillian and Phil had been saying just clicked, and I really got it. And that's what… So, from my NESTA Fellowship, you know, what came out there was looking at ways of connecting designs to value propositions, and that just developed out into BIG design. So my line on value propositions is that what really marks out the best design is generosity, that to give the user or the client what they asked for in creative design is seen as an abject failure, you know, that you should always be giving them something they- well, it was so, the architect of the South Bank, Denys Lasdun, you know, is to give your client what they never imagined was possible and never knew that they could want, but when they see it they know that's just what they wanted. And that's what the generosity is about, that you should design beyond, you know, your goal should always be to design beyond what anyone could imagine was possible. And that to me is the mark of all great design. And Bill Moggridge, you know, used to say when he was at IDEO that, you know, what he loved hearing at times from their design work is, oh, that's absolutely great, I love it. What's it for? You know, people could actually see it was a brilliant bit of design work without really grasping fully what it was for and, you know, that would start a conversation. So I pretty much pulled out of HCI research, apart from in CHI, because the design community within CHI was building up, particularly around Jodie Forlizzi and John Zimmerman from CMU, and Shelley Evenson, and Bill Gaver at the Royal College of Art and then at Goldsmiths. So it was good timing because I could carry on, I could make that move into a design space without abandoning CHI, but I'd just stopped going to British conferences. I didn't have time, I couldn't justify it. I mean there's no way a design school could pay me to go to an HCI conference. There were exceptions; when Pam held it in Northumbria clearly I went to that and we organised

a workshop there. But otherwise it was just NordiCHI and CHI conferences from then on. Because I'd already chaired it and I had a number of roles with a doctoral consortium, but… So that's where I got to, which in the end was seeing how users, how what I call a user focus can work, or actually what I prefer to call it, a worth focus. Because originally, usability's a very negative thing, it's about seeing what's wrong with an interface, and of course that doesn't make you very popular with a software team. And then when it became user experience it got gushingly positive about, you know, a delightful, empowering experience. So, you know, it went from positive… negative to positive. But good design work is about getting the right balance between positives and negatives, there are always negatives. Someone always loses out somewhere. I mean there's always costs: there's cost of ownership, cost of usage, price. There are always risks as well and worthwhile designs are ones that deliver sufficient benefits to justify the sacrifices, the costs and the risks. So- and clearly a lot of user-focussed work and evaluation and user research is relevant to that. But it's a question of timing when you do it and in fact you can do the contextual research at the same time as the design and it, in fact the only way you can forge connections between the usage context and the strategic context and the artefact itself is to do them at the same time. You simply can't do one and then, you know, you've been doing all this human science work and all this business work and now you've got to design the software artefact, well that's just ridiculous. There is no way to do it. What Agile's done is it's shrunk this end and throws you straight into designing. But there are approaches like Lean UX from the States that have really finessed how to do user-focussed design alongside a rapid design process. So that's sort of the story. And I had a lot of management roles in Northumbria as well. And there's other stuff that really hasn't got much to do with design any more, I was head of media and communication design, so I had the filmmakers in my department, the journalists and the graphic designers. Absolutely brilliant having all those staff and students.

[01:14:53]

So in early 2010 you developed BIG – B-I-G – Balanced, Integrated and Generous paradigm. Can you talk about it?

Yeah. So the name was actually a joke. Stefano Marzano at Philips Design had come up with notion of 'high design', which I never quite understood from his writings. And what I thought about high design was that it wasn't, it didn't have enough breadth for me. So I jokingly came up with BIG as an acronym to basically say you don't just want design to have height or depth, it's got to have breadth as well. And it's what Buckminster Fuller called comprehensive designing. So BIG stands for Balanced, Integrated and Generous. So the first thing about design is that there are multiple factors in design and you need to get the right balance. And I mean balance in the sense of a sound mixer. That if you're on a mixing deck, the sliders are not all in the same position. It's not a children's party where everyone gets the same slice of the cake. So in some design work the user-focussed work will take a very large amount of effort because it's something like a mobile app that needs it. So IBM, they have one designer to every three developers in the mobile division. Overall, IBM's got one to eight. They were previously one to 250. So you see, you know, and start-ups like Intercom, they started at a ratio of one designer to five developers, five engineers. So that balance is important, it's about getting the right balance of effort and balance of outcomes. So you have to design what design arenas you're doing the work, and clearly there's an artefact arena where you'll be designing and developing an app or a website or, you know, that digital recording device there, there's an artefact. There is purpose, there's your product strategy. What are you trying to achieve? How will, what will happen in terms of experiences and outcomes, what will you be able to see in the world that shows that that design's a success. What will you accept in the world that isn't particularly good, but it's bearable. So that's why I talk about worth, it's the balance of positives and negatives. It's an interesting word in English. So we know in the cosmetics strapline, 'Because you're *worth* it', it's an adjective that behaves like a verb, it takes an object. You, your beauty, is worth *it*, the cost of the… There are very few adjectives like that in English, but worth is a relationship between positives and negatives. So it's about getting balance there, balance with the artefact, balance with purpose, balance with a valuation, and balance with understanding your beneficiaries. And your maleficiaries. If you're designing against crime, you're designing to harm criminals, so they're not beneficiaries. I mean the people who aren't the victims of crime become the beneficiaries, but the criminals become maleficiaries. So I jokingly have the umbrella term 'anyficiaries', to cover beneficiaries and maleficiaries. So I work with those four design arenas,

John Heskett, the great design theorist and historian, identifies some things very similar in the opening pages of *Toothpicks and Logos*, his book on design. So that's balance, is what it's basically saying is that every project is unique and there is no upfront correct allocation of effort to the different design arenas you're working in. Integration follows because the work in those arenas is separate. They're separate bodies of work, they're separate disciplinary professional practices that, you know, product strategy's a business domain, evaluation and beneficiaries are human science domains, the artefact's a craft domain, whatever the craft discipline is, and if it's service design, you will combine interior design, digital design, product design. You know, all the touch points will run across a range of disciplines. So integration is about how we make those links. Some of them will always be latent and implicit, they will never get beyond a creative leap. You just can't, they haven't got the time to work it out, but because you're taking, if you're taking something through to a good evaluation, you will find out whether it works or not. So you may not understand why you've decided to design something that way, but you've got a strong feeling that it does connect in some way to what you know about beneficiaries, and what you've decided about purpose. Or integration can be explicit, some worth maps do that. I mentioned object oriented design, domain analysis where you identify the objects in the domain and decide which one of those are going to become part of the software. You can have statistical inference, so the Windows 95 redesign was based on help desk calls, that they were- Windows 95 was redesigned to address the biggest problems with Windows. So integration is about making those links and that case from your help desk data to your product strategy, and then generosity is saying that in the purpose domain you do not, you do not ground purpose and beneficiaries solely, you don't just design for what you think people need and want or what they've told you they need and want.

[01:20:22]

If you see opportunities for making things better, you do it, without asking permission, you just wait. I mean Ken Grange did this with a sewing machine redesign where he was asked to restyle it and he made a lot of ergonomic improvements to the sewing machine without asking. So I think generosity is really what distinguishes creative designers from engineering and scientific practices, is that

to do nothing more than what you were asked is to fail, you've actually not added anything as a designer, you're just a workman and you've just come up and, you know, you've put a fence up. You know, you've not really shown what's possible. So Balanced, Integrated, Generous design is an approach to design a framework for design where you're, insofar as resources and time allow, you're constantly balancing and rebalancing the different work streams within a project. Because those work streams are going on separately, you're integrating as much as possible explicitly between those, accepting that sometimes you will not be able to, but the evaluation will make the connection. And then finally, as far as product purpose, as product strategy is concerned, that you're generous. That you don't just ground purpose and beneficiaries, you don't just give people what they say they need and want, you look for opportunities to make things better, you look for opportunities to do things that they've not thought of. And you don't just give them what you or they think they need and want, you give them things that they'd never imagined was possible. In that sense it's not just generous, really good design is delightful.

If you look back at your career, what do you think is the proudest outcome that you had?

Well, one of them's from teaching. I had a remedial social science group and I got them all through their exam, apart from two who didn't make one exam because they were somewhere else together, a boy and a girl in the class. But that just did so much for their self-esteem. And, you know, the students, the pupils were really happy, their parents were happy, my colleagues were just amazed, because these were kids that everyone else had written off, and for a lot of them it was the only… So that still remains one of my proudest achievements in education. And I've always liked teaching, and I've always taken my teaching seriously. So I got a student-led teaching and learning award at Northumbria for my last piece of teaching. I picked up at very short notice, I picked up an advertising module on a Masters course, that was actually an introduction to media theory, so I could teach most of it. And that was for the way that I'd redesigned the assessment very quickly, I'd picked up at very short notice, and coached them in a way that they knew what was wanted and could do it, so I got nominated for the assessment and feedback award and got it. So, yeah. I mean surprisingly for someone that's sort of worked across the board, I think teaching is

something that does bring me a lot of pride and I'm friends on Facebook with a lot of our graduates and I can see where their careers are going. So, you know, I've mentioned my PhD students and what they're doing, I'm proud of all of them. And, you know, I've done quite a few clever things in research, but I can't say I'm particularly proud of one of them more than anything else because I've worked in so many different areas, there's a highlight in each one. So I mentioned the work on dialogue specification. Also within formal methods I showed that you cannot separate the user interface from the rest of the application, because you can't, you know, a handle and blade of a knife, they're separable but they're not independent. You can pull them apart, but they have to fit together. But if you go to three components, if you put a linkage between the user interface and the back end, then you can have separability. And that came back, I don't think the people knew my work at all, but that came back in as business objects for putting a linkage between a database and application, because application code was getting too tightly coupled into the database, logic and structure, so business objects were introduced. Things like a contact and a contact database would be a business object, and that's identical to a linkage. That got me a lot of attention from industry, because they'd really been struggling with that problem, they'd been having a lot of arguments internally, and what I said was, well, the people that say you can't separate them are right if you've only got two components, but if you have three, then you can do it. And that offered, you know, advantages for localisation, for having different national interfaces for accessibility, you could put a different interface on for people for various impairments, so that went down well. And the value-centred stuff as well, I did a keynote on that at NordiCHI in 2014 and I've had a Finnish – that was in Tampere in Finland - I've had a Finnish fan club ever since. [laughs] Because the Finns really connected with it, I think they really connected with that, you know, approaches to design based on values and ethics and outcomes.

[01:25:45]

And what about your work in industry?

So, there was, the work in MARI was on two projects and I wasn't there long enough to really see that through. You know, the thing is in industry when you leave a

project, people change what you were doing. But, you know, I really enjoy them. I don't think there's anything to be sort of proud of, other than the fact that someone asked me to, from one of the projects, asked me to apply for a research professor's post. Microsoft, I was at Microsoft for four months and that's where I really developed worth mapping, that's a graphical way of connecting the artefact design space, whether it's an app or whatever, a website, to the value space. And that really matured quickly and, again, the sort of feeling was at Microsoft was that actually delivered a lot of value to them, particularly it was for a bit of digital furniture called the Family Archive, which would organise all your digital assets and also you could scan in your physical ones as well. But it was the list, it was the set of values that I'd pulled together in relation to that family archive, you know, values around people places and things, the home itself, you know, being able to tidy things up, throw things away because you've digitised them, improved relationships, especially cross-generational ones if you're using this digital table together and looking at old photographs and grandparents talking about things. That was quite funny, and I was talking about audio photography and one of the engineers said, 'Well, if we're going to do that, we're going to have to put a microphone on it'. And Abigail Sellen said, 'It's not got a microphone?' Said, 'No, not got a microphone', you know. And I think someone turned to me, no one had said there was a need, and of course this is then winding up the psychologists who say, we've got no documented need for that, so you can't have it. So they didn't have a documented need, so they didn't have it. So the microphone went on and that led to a really nice repurposing of the Family Archive for stop-motion animation for children in schools. Because what happened on one of the home studies was a child started digitising his furry toys and talking along as he did it, so he basically was recording this stop-motion animation of his cuddly toys and talking over, so they turned that into an application for schools. So I think what- and that list of values, Abigail Sellen did a keynote in 2011 at the HCI conference in Northumbria, where she presented the list of family values they were working to for communication systems and acknowledged me. She said, 'And Gilbert will recognise a lot of this'. So, you know, that part of that project actually lived on for several years as their sort of, their sort of jotter of values to design for. So that's…

[01:28:38]

So if we look back at the work that has been done by the HCI community in the UK, what do you think its peculiarity, or what do you think was the area where they had more impact?

I think what's really distinctive about the UK is interdisciplinary working. We can do it very well, it's not perfect, I've mentioned the way that psychology pulled away from HCI, but not completely. But we just do multidisciplinary work really well. We don't have the hierarchies, autocracies and structures that just drive wedges between subjects. And the funding regime, so the Alvey Project made people work together, then the interdisciplinary research centres made people work together, so there were two HCI ones there. And Equator comes out of that, the big Equator project, and then the Horizon project. These were led by Nottingham, Tom Rodden, and others there. They're just outstanding. And, you know, I've mentioned design work. Steve Benford isn't a designer, he was a computer scientist, but he's also a very talented musician as well, and very early on Steven started with creatives, because they were very interested in the mixed reality technologies that they were developing at Nottingham. So performance art companies like Blast Theory hooked up. And, you know, Steve could do that. You know, he actually, he's worked with a whole range of artists and art groups. He's worked with nematologists [?], one at Exeter, I can't remember her name, she's got an Italian name. I think what you see, I mean it's always, it's not good to pull someone out at one place, but if you look at Steve Benford he does really good technical work, he does really good creative collaborations, he works really closely with the ethnographers in Nottingham. So you've got that, you know, what you want, you want good human science, you want good creative practice, you want good technical craft skills and technology skills all coming together. And the same at UCL, at UCLIC, you know, Yvonne's a psychologist, Ann's – Blandford's – originally a mathematician, but she worked on the AMODEUS project, so she's got that interdisciplinary reach and is a very good human scientist, she does very good, you know, her teams do very good research work. They've got Anna Cox there who is- so there's an example of a psychologist who has stayed in HCI, is able to, one of her PhD graduates, Marta Cecchinato… or she's married now, she might have kept her first name, she's working in computing at

Northumbria. So I think it's that interdisciplinary aspect. And collaboration, not necessarily with industry, but with art groups, with communities. I think they're areas we're particularly strong. Social justice projects. Ann Light, who is at Sussex now, Ann Light's done a lot of work with communities. So has Andy Dearden at Sheffield Hallam. We're not as good at working with industry as the Scandinavians. So I've been an international adviser on two Finnish Tekes projects, it's got a new name now, that programme, but it's essentially the same as the Innovate programme in the UK. And I just get the impression the Nordic companies, that industry expects to work with universities. They just can't imagine it any other way. And there's all sorts of benefits. And government agencies do as well. And you see it in the Netherlands as well. So I've taught on the Masters programmes at Eindhoven, and again, you know, the professional doctorate students and user system interaction, that programme's closed down now. But, you know, I'd be introducing my BIG design stuff when they were starting off projects. One of them working with the local council on their document management system, which was coming under strain because of information, freedom of information requests. They all of a sudden had to be able to find things and that sort of changed the nature of that job. So yeah, I think, I think it's the interdisciplinary. And risk taking and boldness, you know, I think no one in the States would do Harold Thimbleby's research, you know, they'd just see it as far too risky. You know, Harold does it because he believes that we do need mathematically sound approaches to design, and whilst I stopped doing that, he's been able to keep going. I don't think that would have been possible in the States. Yeah. I think we're just bolder. [laughs]

[01:33:24]

What do you think are the changes that will come up in society thanks to IT in the next ten years?

IT as a whole, what I would hope to see, is development practices in AI improving considerably. I think there will be political pressure there, particularly in Europe. At the moment it's a Wild West and people can just do what they want. And it reminds me of automobile design after World War Two where, you know, Ford axles would burst into flames when someone went into their rear end because the petrol tanks were

in the fins. It took years for people like Ralph Nader to get the car industry to take safety seriously. I think at the moment with what's called AI, a lot of the time it's not AI, it's just an algorithm and it's a really bad algorithm. I would hope that people writing platforms that involve Artificial Intelligence or any other algorithm actually take ethical consequences seriously, because they're not at the moment. You know, it's this thing, oh well that's, we don't do that stuff, we just make the systems, you know, we don't say how they get used. So I hope, I think two things will happen. There's two possible outcomes. One, AI becomes more humane and that generally software development develops a much better grasp of human issues. And it's quite difficult for people with a STEM background, particularly if you've done engineering and you've had all these tutorial sheets, you know, you get told something in the lecture, and then you get these little examples to do, and the guy that did the sheet, you know, he or she will write the sheet up, write the answers and say, oh no, that's a bit hard, and they'll change the problem again. And they'll change the problem and the solution until if you've sat in the lectures and you've read the textbook, you can do the examples. And a lot of engineering graduates come out expecting the world to be like that, you know, tidy questions, tidy problems, tidy answers. Which you do get a lot of the time, but they're generally things that we've done, you know, thousands of times before, we've been doing it that way for decades. So I would really hope to see that human focus getting a much better purchase. We've still got a long way to go, but if you look at government digital service, a lot of the online government services are designed to such a high standard though, because they have taken it seriously.

[01:35:51]

Not always. I was using a Beta of the self-assessment website and it had a few quite serious flaws in it, to be honest, which was disappointing because I've just got so used to the British online systems working, I think they are the best in the world and I think, you know, the British HCI community is behind that, they are behind the scenes. And internationally, you know, they brought people in from other countries like Australia, ended up working in the government digital service as well. And one of my PhD students, she's from New Zealand, and she's working on student loans now, but she previously worked in the government digital service. And many of, there's a lot of research students and graduates from interaction design, undergraduate

and PhD working in the government digital service in Newcastle, because the main centre is in Newcastle, and it's there because of the concentration of interaction design and computing capabilities in the north-east of England. Yeah. Either AI becomes more humane, or it'll just go, we'll get another AI winter, people'll just realise that it doesn't work and you can't get it to work, particularly anything based on a neural network. I don't know if you know that if you just put black insulating tape on road traffic signs, an intelligent vehicle doesn't recognise them any more. And we're just talking about small bits here and there. If you've got a photograph of an orange and a photo assist recognition system says that's an orange, if you just edit a handful of pixels, it won't recognise it any more, because the neural network breaks. So, you know, in American terms, I'm wondering when that shoe's going to drop. But, you know, the problem is there's so much invested in it now, just like there was in the automobile industry after World War Two, that no one's going to own up to it not working, you know. People silently took chatbots off, but then they've come back on again now. And they're terrible. [laughs] They really are awful.

[01:37:55]

Is there anything you would like to say that we haven't talked about?

I think, you know, just following on from that point there, that a lot of people don't see HCI, because when it's done well you won't notice it. It's when it's not done well that you notice it. So I think that's a challenge a lot of the time for good design, is that people don't recognise it when they see it because they can just interact with the tool and everything's straightforward and it's enjoyable and delightful, but they don't know how they did it. So one piece of work I did at Glasgow, they had an international festival of design and there was a thing called the Fly on the Wall project, where they found twelve companies with design problems and recruited a design lead to put together a team to redesign. And I redesigned a business information system, it was on funding support. I took that down from four separate applications with multiple screens to one application with three screens. And working with a graphic designer, who also invented the ribbon that Office had several years later, because he just said to me, he's a graphic designer, 'Can I make the icons different sizes?' I said, 'Well, I don't see why not'. And he showed me, he said, 'If I

make this one… if I make these smaller, because they're not going to be used much, I can get them on the ribbon'. I said, 'Yeah, but you can make the important ones bigger as well'. So that combination of three sizes of icons, we did back in 1996. Didn't publish it, you know, it was just a really good graphic designer I was working with there. But anyway, the chief executive of that company, at the design festival, the plan was that they would show the before and the after, but only one company would allow them to show the before, they were just so embarrassed by what it had been like before the redesign. But, you know, I was there for the opening night and the chief executive of the company was looking, he said, he said, 'I can see what you've done, I just can't work out how you've done it'. You know, it was quite obvious: three screens, one app; four apps, dozens of screens. Well, I knew how I'd done it. I mean I could just see, there were only three things to do with this application: look for something, see what you've found, choose it. And then look at it in detail as well. It was just a three-stage search. And one of the separate applications was news, I just put that on a menu. [laughs] So I think this is the challenge for people valuing any design work, whether it's user-focussed, worth-focussed, is that if the job is done well you won't notice it.

[01:40:24]

What advice would you give to someone willing to pursue your career today?

If there's a degree apprenticeship, do it. It's far better to learn on the job than in a classroom. If you can't find a degree apprenticeship, find a good design school where you'll get a studio-based education. And only if you really want to do computer science or engineering, want to do it in those departments, because the design skills are the really important ones. Your craft skills you can keep up to date, technology's going to change anyway. But you really need to find practical ways of working, whether it's a sandwich degree, or a degree apprenticeship where you can combine academic study with actually doing the practice. Because I think the thing about all creative and professional education is there's a real limit to what you can do in the classroom and textbooks, you have to do it, you have to… And the great thing about studio culture is the students learn off each other. You know, the graphic designers on the branding pathway would go and show something to the students on the editorial

design pathway. They didn't want feedback from the branding students, they wanted someone on a different pathway to actually cast their eye. Or an illustrator, you know, and get an illustrator to look at it. And that's something, you know, when I was head of department, I used to impress on the students is that you've really got to maintain good relationships in the studio because you're going to learn far more in the studio from your fellow students than you will from your tutors. So yeah, I would direct them to something practical, social and supportive.

Thank you. It's been lovely talking to you today.

Yeah, and thank you as well. Thank you for including me.

Thank you.

[end of recording]