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Forty years work with computers and visual media

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From about the age of eighteen I started to collect ‘facts’, that is quotations, summaries, statistics, on small cards. At Oxford University as an undergraduate, Dr. Brian Harrison introduced me to the ‘one fact one card’ technique of Beatrice Webb, and showed me his massive collection of cards. I became even more intrigued by this way of trying to break down information, and then re-assembling the bits into a new shape.

When I undertook doctoral research in history, and then later in anthropology, I continued to use this method of hand-indexing. I also used it to help write several books. By 1986 there were about 30,000 cards in my system.

At that point I began to realize that when one exceeds about 30 thousand cards, and collects over a number of years, it becomes very difficult to continue the system with any effectiveness. Among the difficulties is the fact that one’s categories shift, so that things are not in the place where one would now put them; it is difficult to store away new cards, or to find them again. This impasse would lead me to search for computer systems that could overcome the obstacles.

In parallel, when I started my D.Phil. at Oxford in 1963 and realized I would have some hundreds of cases of witchcraft to analyse I consulted the people in the computing laboratory about whether it would be useful to use a computer to help sort the cards and investigate patterns. At that time computers were too underdeveloped to deal with texts and were really just large calculating machines. I was told that the sample was too small to need a computer, so I bought some edge-punched, ‘Cope-Chat’, cards and a needle and tried these out. I can’t remember that they helped, though they certainly covered the floor with tiny bits of card.

I then went to do anthropological fieldwork. I may have been encouraged to broaden out by my supervisor, Christoph von Furer-Haimendorf, an expert photographer and film-maker, as well as by the London-Cornell Project (who partly funded my fieldwork) who provided a tape-recorder and good still camera. Anyway, I began to embark on a more serious use of data gathering technologies, and I added an 8mm film camera bought in Kathmandu. However, in the end, the film, photographs and sound tapes played little part in the analysis and writing up of my thesis on Nepal.

My serious interest in digital media began in about 1973 when I was a Senior Research Fellow in History at King’s College, Cambridge. There was an important research project on Information Retrieval in the Research Centre at King’s. This was contributing to some of the major advances in computer science at the period, including the invention of a new kind of database system based on probabilistic mathematics. Meanwhile, with the help of my future wife, Sarah, I was accumulating

the records of an English village. It was suggested by Dr. Ken Moody that the material was sufficiently massive (and complex) that it would be useful to think of computerizing it.

At that time computers still only accepted input by punched cards or paper tape, generated by an incredibly heavy and noisy 'Flexowriter'. There were no proper word-processing, or even text-producing, programs. Even the largest computer in Cambridge could not for a while hold the 30 megabytes of data which we were generating on the history of an English village.

We entered this world with trepidation and I remember the difficulty we had with the idea of a computer program and with the simple idea of Boolean mathematics ('and', 'or', 'not' intersections). Nevertheless we were able to work closely with two expert programmers, Charles Jardine and Tim King, from 1973 to 1983 and we began to appreciate the growing power of computers.

We also started to plan our work for a world where it would be possible to network computers between different institutions – the ancestor of the internet. Yet by 1981, the formal end of the historical project, such linkage was still impossible, or very difficult indeed. Nor did we ever really find ways of making the computer useful in answering questions, though it helped when we decided to distribute all the materials in a microfiche edition published by Chadwycke-Healey.

Despite the work of historians and sociologists like Roderick Floud and Michael Anderson, it was still not clear how computers could be used effectively to improve research or the dissemination of information. What we discovered was that the greatest advantage of the computer was that it was so stupid. Everything (in those early days) had to be explained to it. So knowledge had to be made explicit and externalized. By the time all the data was in the machine, most of the questions had already been resolved by the far quicker intuitive and lateral thinking capacity of the human brain.

Until 1981, I was learning about how computers worked with texts. This involved working with Jardine and King who wrote an early database management system called CODD, the first effective relational database system in Cambridge. In the early 1980's it suddenly became possible to store large numbers of pictures on a device which could be controlled by a computer, a 'videodisc'. A videodisc had 37 minutes playing time per side. It stored 25 images per second, which gave each side the potential to store 54,000 images, alongside two sound tracks. Suddenly, multi-media was born.

So we made the first anthropological videodisc, on the Nagas of the Assam-Burma border, in the years between 1986 and 1991. At the same time, being a member of the BBC Domesday Disc editorial board, 'in charge' of both 'Culture' and to a certain extent 'Society', I caught a further glimpse of the new potentials of digital media and multi-media.

The potentials of storing huge numbers of images only raised again the questions of retrieval. How were we to find the photograph we wanted? The inadequacy of

relational databases was apparent, because they only found what one already knew was there. There were no surprises.

At this point the early research in probabilistic retrieval in King's bounced back in a collaboration we developed with Martin Porter, who had implemented this search strategy in the Museum Cataloguing system or MUSCAT. So we worked with Martin to design a system for the Nagas, and I subsequently worked with a friend, Michael Bryant, to develop an easier input and database-constructing technology called the Cambridge Database System Interactive (CDSi).

I spent much of my intellectual energy between 1986 and 1990 trying to understand the probabilistic system well enough to write simple manuals, and trying to make the system useful for us. It was both exciting and frustrating and one of the most difficult intellectual tasks in my life. I had visions of producing something we could sell and re-invest the profits in further research, and of making a useful tool not only for myself but other academics as well.

Yet once again there were limitations. There was no 'web', the computers we used continued to be very slow, broke down very often, were expensive, operated in the old command-line way on which DOS (Disc Operating System) depended. There was no friendly front end. This began to change in the late 1980s when we got our first Amiga computer with a windows, icons, mouse and pull-down menu (WIMP) system. But things were still very slow and videodisc as a technology quickly faded out.

Yet my interest in digital media had been aroused and other developments at this time were pushing me further in that direction. One was in the potentials of film in anthropology. Again in the mid-1980's there was a revolution in the possibilities of anthropological filming. Portable, cheap, video cameras suddenly arrived on the market. Although they produced analogue, not digital, film, it was potentially controllable by a computer.

So I formed the 'Rivers Video Project' with several of my anthropology Ph.D. students and we experimented with making short films on historical figures such as T.R.Malthus and the great expert on Nepal, Brian Hodgson.

In fact, video technology of a static and expensive kind had been around for some time. In 1976 I had convened three seminars of distinguished anthropologists and historians and we arranged with the Audio Visual Aids Unit to film two of these. Using several large cameras we made about 10 hours of film, which were shown once or twice. In 1982 Jack Goody arranged for the Audio Visual Aids Unit in Cambridge to make recordings of talks by three anthropologists, Meyer Fortes, M.N.Srinivas and Audrey Richards.

Computers and video were converging and becoming more versatile. When I returned to fieldwork in Nepal in 1986 I took back the small and far from satisfactory 8mm camera I had used in 1969. It had no sound recording ability, no zoom and took only three minutes of very expensive film at a time. I used this again in 1987, but in 1988 for the first time we took a portable video camera. From then on, almost every year until 2001 we visited Nepal and on each occasion took a great deal of film. Over time the technology improved further. It moved from lowish quality, analogue (Video

8), to higher quality analogue (Hi-8), to digital cameras by the end of the 1990's. I bought what I was told was the first Sony mini-DV digital video camera sold in England.

Each year on our visits to Nepal we accumulated between 6 and 20 hours of film, each hour containing dozens of sequences. This again posed the problem of information retrieval – for how were we to find the bit we wanted as the tapes accumulated? The answer again was to index the films with a computer, logging the time codes and subjects, and using the ‘Muscat’ system to search it.

In parallel I was building on the early interviews by Jack Goody and each year, and especially when I did nine interviews at a conference in 1983, I accumulated short and long interviews with distinguished anthropologists and others. But apart from using short extracts in lectures, what could I do with these?

So by 1998 I was fully aware of the potentials of video and computers. I had a digital camera, a reasonable succession of laptop computers, and a database system. ‘Windows’ style technologies were making the early breakthrough of ‘WordStar’ word-processing systems and file handling ever easier. I was also exploring the theories behind these developments and teaching courses on the history of technology and on visual anthropology on a regular basis.

In 1998 a new development occurred when I became involved in a large television project for the Channel 4 millenium project. The aim was to make six programs on the history of the world. Not only did I learn a great deal about the whole process of film making, but was also generously allowed to have copies of the 300 or so hours of original films (‘rushes’) for the series, for use in teaching.

It is a characteristic of computer technologies, according to Moore’s law, that they double in power (or halve in price) every eighteen months. This is also true of other information technologies, including video. So from 1998 to 2004, although it is only a short period of six years, have seen a vast change.

Among the developments has been the flourishing of the internet – servers, codecs, e-mail, wireless communications, broadband, html and a host of related technologies and software, has now opened up a vast new digital universe. It is likely that the next six years will be even more dramatic.

The possibilities opened up by the internet began to dawn on me on a visit to Australia in about 2000. I learnt how to set up a web-site with ‘Dreamweaver’ and made up a modest set of materials. Helped and encouraged by my friend Mark Turin, I subsequently set up www.alanmacfarlane.com, which contains a great variety of texts, photos and films and which I am finding very useful for teaching. My wife, Sarah Harrison, is the expert web-mistress and designer for the site.

In parallel to this, Mark Turin and Sara Shneiderman set up another site called ‘digitalhimalaya’, which was an early attempt to use the web to store and make available important archival film and texts about the Himalayan region. Later I extended this work, in association with my student Xiaoxiao Yan, to Eastern Asia in another web-site, ‘digitalorient’, which is again experimenting with collaborative web-site development.

The advent of the web added the final blow to many of our earlier DOS-based database projects. Having worked for seven years with Dr Tim Mills to convert the Earls Colne project into a form where it could be stored permanently on the University server, we now needed to think of how to have the MUSCAT system re-written for a web and 'windows' age.

In collaboration with a small Cambridge computer company, Lemur Consulting, and particularly Richard Boulton, we set up a project to do this and after two and a half years are very close to achieving a working system ('Bamboo') for advanced information retrieval on the web. In this system we can incorporate photographs, films and sound with texts. We may at last have that powerful tool which I dreamt about in the 1970's, tried to build in the 1980s, and rounded off in an earlier form in the 1990's.