Ten years ago, I looked at IT developments through the software that was around at that time and the way in which it was used. The focus was what software would you take with you if you were to be stranded on a desert island? This paper repeats the exercise a decade later and again attempts to anticipate the future. You live dangerously when you make any IT forecasts, but it is nevertheless necessary to do so because we cannot make progress unless we have some long term if tentative plans. We may be wrong, but planning for the future, however difficult, is better than just letting it happen.

We consider the influences - market forces, technological developments - CD-ROMs and the Internet have happened since last time - and attitudes of society, including its attitude to education.

And the conclusion? What will the world be like when you return from your enforced exile? My optimism is laced with a good deal of caution.

Market forces

In 1986, you invited me to contribute to Australian Educational Computing and I wrote a piece of “advice” on what software to buy and did some crystal ball gazing on future software trends. I reread that piece this morning with some trepidation. Making IT forecasts has got me (and many others) into trouble before - was I in for an embarrassment again? Looking at last time’s list of recommendations, it seems not. A decade ago, the software market was still immature and there was confusion around because teachers often could not understand the market forces associated with software production. Today they probably can, but just to make sure, here are a few reminders - a rewrite of ten years ago but in today’s context:

• Unlike books, software costs are more to do with the expense of creation than with production, promotion and dissemination
  • This leads software producers to look for economies of scale which can be achieved by writing for a platform which is widely available and directing a product to a large market
  • Some producers (eg Microsoft) go to such extremes that sophisticated products are possible because large teams work on them for years. In return, they seek and obtain sales measured in many millions

At one time, a customer with a special requirement could commission someone to write a piece of software for them. This is still an option today, but few contemplate it because of the cost and because they know that they will be disappointed with the result. Bespoke software has to cut corners to be even reasonably priced and usually the quality of the user interface suffers at least by comparison with an off-the-peg alternative.

Educational requirements

In the UK the education scene has changed a good deal since the introduction of the Education Reform Act in 1988. Before then, there was no National Curriculum and schools decided educational priorities for themselves. For IT, this meant that where a school believed that IT was important as a skill to be learned or as a teaching and learning resource, it could also decide to invest a good proportion of its (perhaps slender) time, energy and money in that direction too. Of course it also meant that a school whose priorities lay elsewhere could ignore IT completely but that was happening less and less as everyone came to terms with IT’s significance.

Since the introduction of the National Curriculum however, teachers have been more obliged to do what they are told rather than what they believe in. In the early years of the National Curriculum it seemed that teachers felt more obliged than ever to put IT on the agenda. After all, it had all become respectable - it was there written into the curriculum - which is full of phrases like, “All children must...” - but more recently this sense of urgency seems to have
dissipated despite the imperatives in the National Curriculum and IT has not progressed in some schools.

However, there are reasons to suppose that this lowering of priorities is only temporary. IT’s importance and value has never been greater or more highly regarded and the future looks bright as more and more computer power becomes available with the same price tag. Additionally, pupils are beginning to vote with their own feet so that whereas in 1986 we might have talked about what a school might need if shipwrecked on a desert island, today, we must ask the children. They will not choose software which patronises them, instead they will (rightly) select software which puts power into their hands (ie theirs not their teachers).

The software

So what are the requirements for the desert island of today and are they the same as they were in 1986? Broadly, the answer is “yes” but let us look in a bit more detail. Let us see if there is anything we want to add or cut out and let us consider what new opportunities are available today.

A paint-box program

Now we think in terms of the sophisticated software available to art departments which is able to control colour shading and levels of resolution which would have only been afforded by the art professionals years ago. With the appropriate scanner or digital camera, images created elsewhere can be captured, as can images from a Photo-CD, and worked on; output in full and realistic colour is affordable.

Not all of us have these kinds of ambitions however but today, we also find that good word-processor packages contain their own embedded drawing tools so that simple illustrations can be added to text without having to leave the word-processing environment.

A word-processor

Today’s word-processor, as well as containing simple graphics tools will have desk-top publishing capabilities as well. It will be able to work in a number of columns (not necessarily all the same width) which might change part way down the page. It will have complete control of font sizes and styles which it is able to display correctly on the screen as well as the printer. It will be able to deal with tables and mail-merge.

However, it will also contain tools for the author. Tools which enable outlines to be prepared and filled out, much more sophisticated editing techniques than the old stick-and-paste are likely to be available for allowing sections to be moved around. And of course there are grammar checkers today least in one or two places) so we need not despair.

Apart from the good old spreadsheet, modelling software did not exist - at least at school level - in 1986. Even today, modelling is not seen as an important part of the curriculum. It has been possible to lobby successfully for its inclusion in the UK National Curriculum, but it is not at the heart of learning as it should be. Children model from the day they are born - it is their way of coming to terms with the world they find themselves in. Perhaps it is an important aspect of our mental make-up which characterises us as human. However, in the UK it is not high profile and there are too many who do not understand what modelling really means. Probably, the difficulty that they have is that modelling is so fundamental to our thinking that we are unable to recognise it.

Spreadsheets

Devised for creative accounting, today’s spreadsheet provides us with the best opportunity for programming. This piece of software above all others allows teachers to develop an environment which can be given to pupils so that it is still open-ended. Pupils can be provided with a template into which they pour the data from their own experiments or they can be given a simple model - perhaps to build and maintain a population pyramid and can be expected to adapt it by adding complexities as the inadequacies of their current perceptions reveal themselves.

Database software

I am disappointed too that we have not made more of the opportunities available for sorting and classifying and for encouraging children to undertake their own investigation. Although no longer popular in school, I still find merit in providing the opportunity to undertake historical research by interrogating census and other records via database software. We start with data and move to
information and then to knowledge and finally to wisdom as we learn about the times recorded, the people who recorded them, the transcription mistakes they made and what all this means to us about the lack of historical certainty.

Today, spreadsheets and database software are growing closer together. We can expect them to merge completely in the future.

Exploiting software

In the early days, a user could come to terms with a new piece of software in a matter of minutes but today most software has so many options that it almost becomes a life's work to explore all the options. Of course, most users only need to use part of the facilities provided but the difficulty comes in knowing which aspects need mastering and which can be ignored. It is possible to argue that you need never worry about more advanced features until you need them. The problem with this philosophy however is twofold. First, if you wait until you need the software option before learning to master it, you will always find yourself in a hurry so that you will be tempted to work round it (and resolve to do so later date). Also, it is difficult to judge which facilities you need until you have found out about them.

On the desert island, you will have plenty of time, but can isolated users manage without help?

The word-processor is the most abused package in use. Most people do things the wrong way and get away with it - but at a price.

CD-ROMs

A CD-ROM can hold up to 640 megabytes which, if it is used to store text only is enough for a really comprehensive multi-volume encyclopaedia so a few of those should keep you busy! With diagrams, pictures - stills or video, music or any combination of these they are likely to be more entertaining too.

At present, CD-ROMs are expensive despite the low cost of the medium. As the market grows (so far it has grown very rapidly and we can continue to expect this to be the trend), costs will fall and as they do, this will increase the size of the market still further. CD-ROMs are going to become a very cheap way of providing information. Also, they can provide very powerful search facilities. There are drawbacks however. It is not so easy to browse through a CD-ROM like you can with a book so making decisions about what to buy can be difficult.

Some CD-ROM publishers provide (free) a sampler disc with information and excerpts from all the discs in a range. However, you have to take the sample as it is - maybe the publisher has just pulled out the most convincing extracts.

In the UK, shops and libraries are not good at providing you with hardware so that you can browse and loans do not seem to be an option at the moment.

Another problem with a CD-ROM is that you cannot immediately tell how much data it contains. Although the maximum capacity is 640 megabytes, they are seldom full and one on my shelf has as little as 10 megabytes. Imagine buying a book with 98% of the pages blank!

For my desert island, I would start by sifting through my own library of CD's which include:

1. a text based encyclopaedia
2. a less comprehensive illustrated encyclopaedia
3. several specialist reference CDs including an art gallery
4. literature classics reference library (text based)

5. Some of my favourite photographs converted at a modest price by the local photographic shop onto a Photo-CD

6. games for my grandchildren to play. Some are illustrated books which highlight the text as it is read and include animated illustrations and others are stories which are much more interactive where the user becomes one of the characters and is able to influence events

7. an atlas - containing statistical information about the countries of the world as well as maps

8. software - as an alternative to an inconveniently large number of floppy disks.

I might want to add:

9. the last year’s daily newspaper - with plenty of time to look for our missed opportunities such a resource would provide scope for looking ahead too.

Communications software

With an Internet subscription, a modem, telephone and a little software you can now be in touch with the world wherever you are - the centre of London or Perth, the Welsh mountains, the outback or on a desert island. Those of us concerned with IT are used to see developments happening at breathtaking speed, but even for that community, the take-up of the Internet has been remarkable. There is no point in trying to give figures because the rate of change is such that any impression given would be out of date before this article could be published.

Now that so many of us have access to electronic mail it is becoming an imperative for those that are not yet switched in. It is a good system, far less disruptive than the telephone and much quicker and cheaper than snail mail. However, it does require people to regularly check their mailbox to see if there is anything for them. I have no difficulty about this. I send so many messages myself that I usually find it necessary to log on to the Internet several times a day and it is rare for there to be nothing in return. However, for those starting, there has to be an act of faith and if you log in regularly once a day for a week and no one has sent you anything (not because you are not loved, just because folk have not yet got into the habit), then there is the temptation to not bother. When that happens, those wishing to contact you will find their mail returned and will stop sending messages.

On the desert island, it will also be the access to the World Wide Web which will make the high telephone costs worthwhile. Here, with the right searching services, an untold wealth of information will be waiting for you. Perhaps you will put up with the very disorganised way the information is held and you might be glad like me that it is because no one is in charge! I accept that it is necessary to protect young minds from some of the material available, but the solution is to arrange for children (if you cannot trust them) to have access to the Web via a filtering system (which either includes only data which is recommended or only seeks to exclude undesirable data - I prefer the second alternative).

Future trends

When you are rescued in ten year’s time, what will you find? You can expect the cost of computing to have fallen and its sophistication to have grown. Societal attitudes will have changed so that the computer will be as ubiquitous as the telephone today. The recent trend of providing a help button instead of weighty manuals which no-one reads will have reached an art form. Built-in help is cheap and convenient and it served you well while you were away because it did not get left behind in the wreck. Software will get cleverer at working out what you meant rather than what you said and the users will grow more irresponsible.

At the present, we are still working out what to do with CD-ROMs. Tomorrow, I go to review some Maths CD-ROMs to see if they fit our National Curriculum and I am not looking forward to it. Am I to give ticks to those discs which will bring quick returns to harassed teachers or should I be promoting something which is attempting to extend our thinking and through that the curriculum? In ten years time, the successor to the CD-ROM - whatever it is - will be designed by those who are no longer constrained in their thinking by starting with a book metaphor and our ideas about the curriculum (if we survive as a nation) will be about the process of learning, not just about skills and facts and what today’s government tells us is important.

In the UK, we are beginning to get excited by the idea of the superhighway. This is seen as a broadband communications network which will allow very much faster communication than we can achieve via the Internet by using ordinary telephone lines. However, the commercial incentive is to provide the physical network is so that entertainment can be piped and sold to homes but we suspect not into rural homes and certainly not to desert islands. It is by no means certain that truly interactive access to the superhighway will be an option. The Internet was developed on the back of an existing telephone system so that no one had to negotiate the way it should be organised (some would say disorganised). It is a worry that the superhighway will be under the control of the same media giants who dominate daily newspapers.

As citizens in the 21st century, we will have to ensure that we educate the coming generation with the skills and sense of responsibility which will protect society from its worst excesses. That will be your greatest challenge when you return.