

The Future Of e-Business *Lecture at the Royal Museum in Edinburgh*

There will be more change in telecommunications over the next ten years than has been witnessed over the previous 150. Throughout the whole of technology and technological changes, there has always been a reticence on the part of the user. At the advent of the telephone we heard, "I do not know anyone far enough away to warrant using one". At the advent of the mobile phone they were just seen a "yuppie toys" and would never be of any use to normal people. It is always the negative that seems to be in the front of people's minds as things change. Very few people can see the opportunities of doing things that have not been done before. Old predictions, such as the number of transistors doubling every two years on a computer integrated circuit, will look pedestrian when compared with advances in the near future, likely to be organic computers. These will be built using nano-technologies, and might even involve physically growing a computer to do a specific function, using enzymes and proteins to undertake their construction. And once computers start to be living entities, will they be afforded rights and privileges? If you reach for the mains plug, will it be classed as murder? If it fights back, will it be "self-defence"?

The next enormous leap is going to be broadband. Already, BT has undertaken to have 100 per cent coverage of the UK by 2005, but at the moment only 2 million people have taken the service from BT and another 1.5million with cable companies. In Scotland, only 3.5 per cent of the population has taken the service.

Why so few? Well, the first question asked by most people as they look at the monthly subscription is, "what will broadband do for me?" Fast internet access? "I do not surf that much"...Things do not change. What most people have yet to realise is that broadband is a "disruptive technology". It is one of those technological changes that will completely alter our lives – the way we work, live and socialise. We have seen and overcome such vast changes in the past. Water power removed the use of human hand labour. Steam power killed water power and added opportunities of transportation. Petrol power killed steam power, and information power is just the next major change in our lives.

The one word that encompasses this next change is AORTA (Always On Real Time Access). With the advent of the always-on network we will see the human being extracted from the process of gaining information. Up to now, we have had to be the central part of the information-accessing procedure. We had to know which software to mount on which machine, where to put the machine, where to plug it in and how to connect it with which

cable into which plug and socket. Then we had to know which phone number to dial to get which internet service provider, so that we could start hacking through a QWERTY keyboard at the mountain of information.

In the AORTA world, the network is always there, always connected and information will be accessed on our behalf. We will be extracted to the periphery of the process and need only execute executive decisions when necessary. I see artificial intelligent agents living in this always-on network, seeking information that might be useful to us and pushing it towards us for a decision. For example, I see the first agent you will use being a TV-watching agent. It will just appear in the box that you will still call a TV, but which in practice will be a very powerful digital computer as part of your home network. The agent will watch what you watch, know what you like and dislike, by learning, not programming via a keyboard. It will seek out the programmes that you might want to watch and push the relevant programme listing towards you. Just think, the programme listing for all the digital channels of TV in the near future could be over a metre thick every day. These agents will have faces, and natural voices – not the tinny, twangy American voice of computers of yester-year. They will listen and understand what you say, without training your voice to the machine, nor the machine to your voice. They might even have personalities and show emotions. The whole process will become “conversational”, and at that point the process becomes so easy that everyone can do it without worrying about the complexity of computer programming. These agents could possibly be sales assistants or bank tellers or teachers, in new artificial online environments – all of which are becoming very realistic looking. In the near future, everything will be carried on an internet-working protocol (IP) platform. Gone will be the need to establish a permanent connection through the network before information can be passed to the other end. All information will be encapsulated in IP packets and they will find their way through the always-on network to their destination. At the moment, the majority of BT’s revenues – and profits – are generated from the “old-fashioned” telephone network. And in such a situation there is a great temptation to “stick with what we know and understand”.

BT, on the other hand, is addressing the future. The design and creation of the 21st century network is a testament to this forward thinking. A network that is purely an IP transport medium, allowing everything to be connected to everything else. New technology being pioneered by Motorola allows active circuits to be printed, using ink-jet type technologies, on paper. So inside the paper wrapper on a tin of baked beans could be all the information about the tin. Not just that it is a tin of beans, but that it is that specific tin, manufactured where and when, been transported under these conditions of temperature, and so on.

As the shelf stacker puts the tin on the shelf and simple interrogation lets the shelf know that it has been stocked. When you remove the tin, the shelf realises it has lost stock and automatically starts the re-ordering process.

You get home and your stock cupboard goes through a similar process with a simple sensor. You remove the tin and the cupboard talks to your 3G mobile – always-on – phone, which

Looking at the Future Slightly Differently

generates a list for your next shopping trip. On arrival at the store, the doorway interrogates that phone and gives you a floor plan of the store to ease your shopping chore. That is, of course, if you have not shopped online. As part of this information exchange, we as humans will also be involved. At an electronic “point-of-sale” machine you will offer your new “chip&pin” banking card, which you will have to hold so your thumbprint is read by the hologram patch. It is the seamless and especially the effortless nature of this new, networked society that is its strength and appeal. The “e” world is disappearing as fast as “new pence” did in the 1970s!