The Handbook of Call and Contact Centre Management
Section 3 – The Future

History is a Bad Predictor of the Future

One of my many memories of the Gulf War was a TV news article in which "Stormin' Norman", the general in charge of the battle who took time out to conduct media briefings, made reference to the big movie screen beside him. The screen showed the view from one of the attacking aircraft as a smart laser-guided bomb was launched towards a bridge. Quite clearly a vehicle could be seen driving onto and across the bridge, and Norman quietly said, "…and at this point he looked into his rear view mirror and….." BANG! The bridge disappeared in a cloud of dust and debris leaving the loan vehicle scurrying away on the far side.

This story demonstrates two things. One, always keep a look-out over your shoulder and, two, life is not always linear and simple.

Unfortunately most people and quite a lot of those that claim to predict the future spend most of their time looking in the Rear View Mirror. This sort of action can be reasonable productive in stable times – minor course corrections being all that is needed – but occasionally as that driver witnessed, life becomes amazingly non-linear. These non-linearities are what I call Totally Disruptive Events and in the last few hundreds of years they have in the main been caused by technology changes. Small changes have produced massive, unpredictable effects, changing the way we live, work and socialise – in fact everything.

If you think back only as far as the Industrial Revolution. Before then people worked with animal power, the skill of their hands and the intellect of their minds. They made things and bartered in the local community, they lived in small cottages with roses growing around the door and all was well. That is of course until the water-wheel was invented. Suddenly there was the power to do things that were not possible with animal power and human power. But the power was at the base of the valley and that is where the mills were constructed. People had to move from their rural locations to the vicinity of the mill, and urban sprawl started. Then there was the invention of the steam engine which meant that the factory could be built anywhere and the industrial nature of our countries was established.

And, of course, the water could be used to form a canal system. These canals allowed us to transport the goods that were produced – not just a few pounds in a horse and cart for a few miles, but tonnes and tonnes right across the country. The whole means of transportation changed. The coming of the railways extended the capability of the transport system, and was so successful that the railway companies started to buy up the water-ways to fill them in and extend the railway system. Railways became such a dominant part of life that the need for standardised time became necessary (GMT).

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The advent of road systems reduced the popularity of the railways as goods started being delivered door-to-door not depot-to-depot or station-to-station. Each of these changes was quite sudden and completely destroyed the way of life experience by people under the older system. Very few people other than those actively involved in the technologies could see the changes before they happened. In fact most people could not give any credence to the possibilities of the changes – after all would not the extreme speeds predicted for the new railway systems cause people to die as their lungs were filled by the highly pressurised air speeding past them?

Throughout the chain of Disruptive Events one thing is clear – we have always managed (eventually) to accommodate the changes, embrace them and use them to our advantage. But history is a very bad predictor of the future – just because we have survived this far does not mean that we will continue to survive in the future. The next Disruptive Event is about to happen and that is the Information Revolution.

Circuit and Packet Switching – The Next Difference

If you think that we are already been through the Information Revolution – think again, it has not yet even started! We so simply throw around concepts such as "The Internet" and "the World Wide Web" that we completely overlook the implications for our life and our work. It is so easy to think that these new technologies are simply an extension of the old telephone network.

The telephone, which may or may not have been invented by Alexander Graham Bell but it certainly was commercialised by him, liberated our ability to communicate over vast and increasing distances. The device was not universally welcomed. The Minister for Posts in her Britannic Majesty's House of Commons is quoted as saying, "Whilst this new fangled telephonic apparatus might be all well and good for our colonial cousins, it will serve no use in the United Kingdom because we have a surfeit of messenger boys". Not to be out-done, the Chief Engineer of the Post Office wrote, "My office is in full knowledge of this device, and we can see no merit in it at all." It is always difficult looking forward rather than in that Rear View Mirror!

But the system advanced and became established. People started by using the phone in the red telephone box on the street corned and eventually allowed the device into their homes and offices. The phone was a magical device, you simply dialled a few numbers and these were translated into a routing through the network so that you were connected to the far end and you could talk. That is all you could do – just talk. Over the years the system was extended by the Fax machine so you could send an image of a piece of paper down the telephone line and reproduce it at the far end. A simple system that required a continuous connection from you to the other end and dedicated to you for the whole of the conversation.

But in 1957 something happened that would change everything – Sputnik! The Russians launched the first of three man-made satellites – just as predicted by Arthur C. Clarke in the 1940s, but no-one took him seriously. The first was a small aluminium sphere weighing 84Kg which carries on enough electronics to make a beeping sound to tell you it was there. The second carried an experiment to measure changes in the earth's magnetic field, and the third (weighing 1.5 tonnes) carried the dog and the biological experiments. President Dwight D. Eisenhower realised that if an enemy could launch satellites these could be bombs that could rain down from space. His reply to this threat was to establish two initiatives. First to build the Interstate system of roads in the USA (1959 saw the Preston by-pass in Lancashire, the experimental process for the UK motorway system) and second, to establish a "bomb-proof" communications system. A telephone system which needs a continuous and dedicated circuit can easily be disrupted, so the Rand Corporation and the associated academics of the time started to experiment with "Packet Switching", which does not rely on continuous or dedicated circuits and is a system that can re-configure dynamically.

This has become the basis for computer to computer communications. Each computer packages the information that it needs to send into "packets" – very similar to an envelope with an address (header) on the front and the information (letter) inside. The packets are then despatched and find their own way through the network, frequently not using the same routing as the other packets in the same "message". This diversity gave the resilience to the communications system.

Originally this system was confined to a few academic super-computers, but during the 1980s and 1990s the system became more widely available to individuals who could access the network via telephone lines. In the early 1990s browsers were developed and allowed "point and play" graphical interfaces which allowed general users to have a simple, easy and fun method of using the system. At this point commercial interests started to show interest in the new system and soon the World Wide Web (as it became known) became the dominant means of passing information. The 12th November 1998 was the first day in the BT network where there were more data calls (machines talking to machines) than voice calls (people talking to people)!

Very soon the data-calls started to swamp the telephone network, so by the end of the year 2000 the whole of the BT phone network had been over-laid by a new data network called the "colossus network", using routers rather than telephone exchanges.

The foundation is now in place to start the Information Revolution……

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The Home of the Future

I see these changes becoming most apparent in your home, where we are seeing the first skirmishes in the Information Battle beginning to happen. For years the only information connections we had in the home were letters, a telephone and a TV antenna. Then there were satellite TV and cable connections. Suddenly there is the "Could I interest you bundle of services, TV phone and Internet access?" offer. In the future people will not care, let alone worry about, how the information arrives in their homes any more than they strive to understand who their car engine works. Plugging into information will be as easy as plugging in a power cord – and when was the last time you questioned if electricity would flow out of the socket?

In the near future information will arrive across the whole spectrum of services and be combined at the point of human interest. That point is likely to be the television, which in practice is likely to be a very powerful digital computer, but will display a movie if that is what is wanted. The television will become an Information Portal, with probably the ability to display different things on different screens in different rooms – the advent of the wireless LAN (such as IEEE802.11) will remove the constraints and cumbersome expense of cables.

Delivery of the information will be easy – the challenge will be how are we going to be able to accommodate and assimilate all the information that is so readily available? To this end I feel that we will require some assistance, and this will be in the form of Artificial Intelligent Agents. Now at this point most people become fearful, which I feel is unnecessary as these agents will not be artificial nor intelligent – just small packages of software to assist you. They will learn your interests and preferences and actively seek out information that might be of interest to you. At a convenient time this information will be offered for your perusal. For example, I imagine that the first agent that will be used will be a TV watching agent. Just imagine, in only a few year's time, when there are thousands of digital TV channels available, how are you going to know what is available? Will you really read a programme guide that is over a metre thick every day? No, you will have the TV agent sitting next to you on the sofa watching what you watch and suggesting suitable viewing. The TiVo systems is probably the first such intelligent system to be demonstrated.

These agents will also have voices and speak in a natural human like voice. They will listen and understand what you say without having to train your voice to the machine nor the machine to your voice. They will even have faces. These agents will not expect to be programmed, they will engage in conversations – it will be like talking to a friend.

So general information will be simply collected at the appropriate times. For example, take household insurance. The Insurance Agent will know the date of renewal and in the last 30 days of the cover period will be seeking suitable terms and conditions from commercial agents in the insurance business, using data stored from last year's exchange and any new changes that have been acquired during the years, such as new furniture etc. from my

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shopping agent. This data will then be offered to you for decision – I do not see these agents making executive decisions. You will then make a decision based on your priorities – and cheapest is not always best – and at that point you will probably seek personal contact with the organisation of choice. If this contact is a simple telephone call to a call centre, then we are back in the Dark Ages.; Name? FirstName? Address? PostCode? Etc. etc. etc. all tediously done by voice and keyboard at the far end.

This is where we step into the future of communications. In the old days we could just talk over the phone which made the transfer of data tedious. Once we step into the Internetworking Protocol (IP) world things get much simpler, quicker and easier. When we start using systems where voice, data and vision are one simple connection over one network, not three separate connections on three networks the exchange of information becomes effortless. The voice channel is established to a call centre. My intelligent agent passes all the data that has been used and collected over the simultaneous data connection (no more re-entering of data) and I can browse. At that point I might be comfortable to complete the transaction without further recourse to a human operator. I frequently these days make purchases by entering personal details and a credit card number and complete without "talking" to anybody. If, however, I need further details, explanations, confidence etc. I will be passed to a human call centre agent who instantly knows and can see all the previously entered data and be only involved at a level in the transaction which requires the human intellect.

On the Internet today you will often see "Call Me" buttons. By clicking one of these you will be asked "at which phone number?" and "when?". The latter most people find strange, but today most people surf down the phone line which makes talking to them on the phone impossible. They have to close down their browser (I hope that they printed-off all the pages that they had been looking at!) and wait by the phone for the call to be made. In the data-world of tomorrow, you will click the button and instantly a voice will arrive through the screen. A conversation like: "I see that you are looking at Caller Display 20; could I interest you in Caller Display 50?" might well ensue. Do you remember in the old days when you had to drive to the centre of town and stand by a wooden counter whilst a human assistant laid out products and helped you to choose. Soon that will be possible electronically.

And once voice, data and vision are one simple connection over one network, not three separate connections on three networks the button will become a "discuss with me" button – face to face communications over a device that you will still call a TV! Which, of course, raises the issue that if call centre staff are to be seen as well a heard, will they have to be dressed in corporate clothing with that newsroom chromo-key bustling office behind them?

Instant Access Anywhere at Any Time

The challenge for the information age is "Seamless, effortless, ubiquitous access to any information, on any topic, at any time, anywhere that I want it". The information age is going to be very personal.

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I do see us carrying large amounts of information with us at all times and exchanging this information even in public places. Today we are seeing the introduction of Smart Cards – those credit card size pieces pf plastic which have small gold contacts on their surface. The banks alone are issuing over 6 billion of these across Europe in the next 5 years. Behind the gold contacts there is a chip which contains the information. With a little bit of co-operation in standardising the way that the information is written to the chip, we could carry everything on one card – from supermarket loyalty cards to your passport.

This card will contain all your personal details, preferences, likes and dislikes. By simply inserting it in your chosen communications device (TV, computer, phone, mobile handset) that data can be transferred. No more need to enter name, address, "Aisle or window seat, sir?"

With so much information so conveniently packaged we are going to need extreme security measures to protect it.

Security

In the information age security will be paramount. In the old days we were comfortable to pass very personal information in a letter confident that it would reach the desired location and not be compromised. Now a letter is the easiest thing to open and read, but there was an existence theorem that the information was safe. Once the information is in the hidden and invisible area of electronic transfer then we feel exposed and uncertain.

What we need is the confidence that adequate security will be enacted at all times , in all systems and at all levels.

The greatest threat in the security area is people! I personally have over 40 different computer systems – I have even just filed my self-assessment tax details with the Inland Revenue over the Internet – and each of these systems requires a different alpha-numeric password. Each of the passwords needs to be changed every month – "for security reasons", my systems manager tells me. Such over complexity makes people like me produce simple solutions to the unacceptable burden that I feel is being placed on me – I write all the passwords down! Now there is no security at all.

What I see happening in the future is the removal of the human from the system. A security system needs to totally transparent to the user and require no active involvement. To this end bio-metrics is one solution. Fingerprint recognition is a well known method of identification (although connected with crime). I see in the near future the little hologram on the front surface of your smart card not just being a security device to indicate that the card is genuine, but also a finger-print reader to indicate that your are the person who should be using the card. As mentioned I see smart card readers being incorporated in most if not all

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devices that we use, and such a card could become a universal key to provide the security we need. Not only "this is my information" but also "and this is me offering it – honest!".

Other systems are being considered. One that might be the final solution is the iris recogniser. Apparently the iris (the coloured part of the eye) is a very good personal indicator. The lines in the eye are constant throughout your life and contain enough individual information that you can be recognised with a certainty of 1 in 10^{24} – which is much greater than DNA testing, a process that is trusted in a court of law. And apparently (the squeamish can move onto the next paragraph immediately) the device also contains a pulse recogniser so you can not just gouge out someone's eye or carry a comatosed victim to an ATM!

With these levels of security it would be possible to simply register with a device and then all your personal details would be processed and transported over the always on always connected information network.

The Impact of Mobility

Everything is going mobile! This is another example of the Disruptive Technologies. Just look back to the early 1980s, there was a man walking down the street with a half house brick apparently clamped to the side of his head – and he is talking to it! Did anyone really believe that it was anything but a fad? But it happened. There are now more mobile phones in the UK than people.

In the near future people will insist that they have access to everything via a mobile appliance. The advent of 3G mobile systems will mean that there will be an equivalent connection in the mobile world as we have become used to in the wired world over the last few years. Bandwidths and data transmission rates will become large enough to ensure that there will be no waiting in wanting. Unlike the WAP phones of the late 1990s there will be "permanent connection always on" data, so the retrieving of data will be a background activity. No delay means that humans will use the system without frustration.

The new 3G phones will have a landscape rather than portrait orientation. They will have larger, colour screens with higher definition – there will be no buttons to press, voice dialling will become the norm.

With such equipment people will start demanding information from their mobile devices. "What's the balance in my current account?", "What is on at the cinema?", "I would like one of those – where can I buy it?" There is also a great likelihood that by carrying a mobile device you will be tracked and information that is pertinent to you in that location will automatically be fed to you.

There will be a great demand for information and the call centre, be it an artificial agent or a human agent will be the centre of this demand.

e-friendly

Above all, in this new instant interactive information world, systems must be *e*-friendly. The human fronted call centre was the ultimate interface for most people. Almost everyone can talk and listen and the customer could leave all the difficult details to the call centre operator. As more and more of the process is handled in the automatic machine world we must take great care to ensure that it works well, to the point where it becomes transparent.

In the days before the complete transfer of all personal data from my secure card or secure memory location there is a need to remove the complexity of the system "front end". Most people these days are familiar with the data entry boxes on internet pages. At best they are simple, at worst they are tedious. New systems are being designed to make use of the ability to combine phone calls and data calls. An example is one of the "spin-out" companies being created at the BrightStar incubator within the BTexact Technologies at the Adastral Park site near Ipswich. In this system data entry can be by keyboard or voice or any combination of the two.

Whilst addressing a web page on the Internet you have the option to "phone " the page as well, using a standard phone or a mobile device. As you look at the page a realistic voice asks for the data, such as "What is your family name?" and you can enter the data by typing or speaking. Furthermore if, whilst the system is entering your name (by voice) you are adding the data for your date-of-birth in another part of the screen (by keyboard), then the system acknowledges that input and this data is not requested by the voice system.

Recently I used such a system to request house and contents insurance. Having conveniently filled in the data I was transferred to a human agent who undertook the higher level requirements capture. But the best part of the system was that both the agent and I could see exactly that same web page, different options being detailed in a manner similar to being sat at the same table looking at the same piece of paper. Gone are the days of having to listen at apparently supersonic speeds to an agent who has done this procedure a hundred times already today and then being expected to make choices. Similar procedures will be in call centres to address customer complaints and queries. For example, an enquiry about a phone bill is so much easier to handle if the conversation starts "here is the bill, and can you see this number?" and on the screen is not only the bill but a highlighted area that is being discussed.

The whole aim of customer relationships in the future is to give the impression that that customer is the only person who is being addressed, and more than that the most important person in that group of one. Stroke the customer – made them feel wanted and they will return.

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Unfortunately, a bad customer experience is more and more likely to result in that customer going elsewhere. After all, the new information systems will make the ability to set up customer centres relatively easy, and moderately cheap. All a dissatisfied customer needs to do is "click" and they have found one of your competitors. And the total lack of effort required to produce that single "click" will mean customers will be very fast to change allegiances. I was surprised recently to be told that many people are changing their house mortgages every few months to get the best interest deals. Only a few years ago most people would have only changed a mortgage once they had gone past the level of "unbelievably dissatisfied" with their old supplier – the process was perceived to be to complex and difficult.

So ease, simplicity, good visual appearance and accuracy are the main stays of good customer engagement.

Working in a Call Centre

"Call Centres are the modern Elizabethan equivalent to the Victoria sweat-shops!" The words came floating above the heads of my colleagues at a customer event. I would not be surprised to find that in some cases that is true. As we move into the technology age, however, I do not see the bad call centre surviving. The ease of connection will enable more and more people to connect to the call centre facility (more likely to be called a Contact Centre than a Call Centre) and the ease of being able to register one's dissatisfaction by a mere click, will ensure that the poor ones do not survive.

I see a lot of effort being put into the call centre environment in the near future. The customer expectation is speed, accuracy and a "good experience". In order to provide this the environment of the call centre must be maximised. The environment must be productive, protective and enabling – people are most productive when they feel safe. We have all seen these large sheds with rows and rows of desks and the big indicator boards broadcasting just how badly things are going. It has always surprised me that some managers seem to think that by constantly telling people how badly that are performing will, as if by magic, encourage better performance.

In the old craft days people produced artefacts that could be examined and judged. In the modern "invisible" knowledge based industries there is nothing so tangible to assess. So in a desperate drive to measure performance any metric is grabbed and pressed into service.

In the early days systems were mainly manual and paper based. One could easily see an "in-tray" and if the pile was excessively high that meant that these was a problem to address. If the pile was non-existent then there was still a problem but of a different nature. As systems gained in complexity the ability to visualise what was happening diminished in practice but most people believed that they still understood the procedure. The reality is that most systems have grown organically and to great complexity, to the point where no-one actually understands the processes any more.

Call Centres of today are complex – tomorrow they will be many more times as complex as today. What is needed is a system to investigate and analyse exactly what is happening in the system.

In the Consultancy group within BTexact Technologies such tools are being generated. They are called "Lean Engineering". A team of engineers visit the system and by question and answer audit what is actually happening – not what everyone thinks aught to be happening. The data from this process is processed through the Lean Engineering Tools and the output is a report. But not the usual written report bound into three volumes, but a simple simulation of the system.

One example of this process is a study done on a call centre. The data was collected and processed and the final "report" was a model which pictorially showed the "Before and After" scenarios. The former showed a 3D dynamic depiction of the current state of the call centre with rows and rows of desks and supervisors at the end of the room. The latter showed the suggestions for reforming the system, a concentric approach with supervisors in the middle and agents around the outside. The model was then run using that same calling pattern for both visualisations. Believe me, it did not take an expert in rocket science to notice that the old system rapidly had long call queues whilst the new system had not only no call queuing at all but needed fewer agents and supervisors. Implementation of these processes lead to a more productive work environment and less stressed agents – a total win. As an example one well know telecommunications organisation saved $20 million in a process that had previously cost about $60 million a year. That is a saving of $20 million this year and next year and the year after……

The Call Centre Environment

Historically, Call Centres by their very size have required big, booming, high warehouses of buildings. Dividing the floor into functional areas or team units has to some extent reduced the expansiveness, and the inclusion of low dividers to create the "open-plan pig-pens" has had a unifying effect. But little else has been done to address the working environment.

There has need a lot of research undertaken recently, both in the USA and in the UK looking at the call centre experience from the agent's point of view. Most call centre agents these days work from a computer screen, but that screen is still using the old paper metaphor – it is just vertical rather than horizontal when the paper used to be flat on the desk surface. As humans we are able to assimilate information that surround us not just information delivered directly to the eyes and ears. As an example, in the USA one researcher injected noise into a call centre. The more calls being handled the greater the sound of rain falling onto a roof or a puddle. Now most people think that the noise would be distracting and irritating, but the human has the ability to filter sounds – next time you are in a crowded room just imagine has confusing it would be if you tried to listen to all the conversations all the time. We filter and concentrate on the one immediate conversation. However, this does not blunt your ability to "home-in-on" the remote comment which contained your name. We are listening to everything and filtering that which is not appropriate at the time. Similarly the noise of the rain gave people a feeling of being involved in the greater environment without distracting from the task in hand.

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We can also change the visual environment. At the moment we have a telephone, a screen and a keyboard. Text is read from the screen and typed into the keyboard. Simple but very limiting. Computers these days are very powerful and we can use this power to make then deliver information in an analogue manner rather than the digital computer way. As a human I am wonderfully powerful in the analogue world. My eyes can accept Gigabits of information every second and I have an analogue "wet-ware" computer in my head working at the same data rates. I have spent all my life living and working with coloured moving pictures. So why when we go to work does everything become so boringly digital?

Work recently undertaken by Bournemouth University and BTexact Technologies has addressed this concept. The screen is no longer a paper and character environment but becomes a visual pictorial working area, a Motivational User Interface or MUI. It looks like:-

The environment is a surrounding "point and play" area. The view from the patio doors is of a seascape and sky (infinitely adjustable to personal requirements) and messages, in this case towed in by a hot air balloon can be of a general nature. The working environment is laid out pictorially as a desk and the phone keypad and the customer data areas are clearly visible. The black hand in the centre of the picture is a pointing device which activates the environment. Pointing to the customer data causes, for example, a phone bill to fold out and the image can be shared with the customer highlighting areas of interest or discussion as mentioned above. At the end of the customer exchange the "customer" (the small red ball in the centre of the picture) can be dropped into the trashcan to the left of the picture – very satisfying at the end of a tedious interaction!

As a student project this environment is still on a vertical screen. One of the technology advances that will be upon us in the next few years is the large flat relatively inexpensive

screens. The advent of very-wide screen TV will make such screens household items and hence the costs will become reduced. I see these screens being incorporated into the surface of desks or tables, so your working space will be laid out horizontally before you. Do you realise that we are 65% more efficient working on a horizontal plane than a vertical one? Just think, when was the last time you held a paperback book vertically in front of your face to read it? The large screens will be pressure sensitive (you are seeing them already in hand held PDA computers) and your working environment will become truly point and play.

The advent of modern Information System means that the original requirement for all the functionality to be co-housed is no longer necessary. Small units can not be closely associated without being geographically co-located. The advantages of being able to utilize a number of convenient small units rather than one great barn are easy to see, but the disadvantages of "being with others" is less easy to overcome. A while ago there was an experiment in a company with multiple engineering sites. The experiment consisted of two large TV screens mounted on the walls of the two works canteens and a video link between these screens. Consequently it was possible to "look through the hatch" into the far end and have "face to face" discussions. The experimenters quickly realised that the people using the system rapidly stopped seeing the equipment and started just experiencing the far end of the link. Complex, detailed and regular discussions ensued as people frequently "met" others who were in practice 60 miles away.

All computers manufactured in the last two years are "video-ready", and more and more of this type of communication will permeate into our lives. Remote supervision is not out of the question if the contact is so complete that you can do anything, other than shake hands. Which leads to the possibility that Call Centre agents might be completely isolated – to work at home perhaps?

The Home Worker

"Do NOT talk to me about home workers!" said the MD of a well known high street company, "all they do is skive all the time – I would never get anything out of them." Now I get this sort of reaction many times from many people, but I feel that they could not be further from the truth. Oh yes, I will grant you that some will be "cyber-skivers" but these would have been the very same ones that skived at the wooden desk in an office.

In the old days of phone and letter there were very few people who could work from home and these tended to be "individual" workers such as authors and columnists. As things got more modern, the addition of the Fax meant that more information could be transmitted but the channel was still cumbersome and required a large assistance to the remote end.

The addition of modern networking allowing *e*-mail and file transfers has meant that the home worker can have access to communications and information from the home just as easily, conveniently and simply as being actually in the office.

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An example of such home working was an experiment undertaken by BT, in which 12 agents on a directory 150 service were allowed to work from home. They were equipped with special furniture – not only as a means of holding the equipment but also to ensure adequate security of the very sensitive data that they needed to access. The connection was over an ISDN (128kbit/sec) telephone line.

At the beginning of the shift the agent called the supervisor and there was a full video interaction to ensure that the agent was well and not under any duress. The working part of the shift was then initiated using one of the ISDN channels for contact with the customer and one for access to the databases.

In the off-duty times there was access to electronic coffee room "chat areas", and electronic notes could be pinned onto staff notice boards. Such social interactions alleviated the feelings of remoteness.

Whilst this is now a quite old example it did highlight some none technical problems. If you work from home does your home attract business related local taxation? How do you apply the Heath and Safety legislation to your home, etc?

ISDN is a much faster connection than the plain old telephone service, but just imagine the possibilities as we move into the new realms of broadband connections. The current offering of ADSL (Asymmetric Digital Subscriber Line) allows permanent connection to services and information and transmission speeds that are equivalent to those most people experience in an office environment. Soon the tedium of commuting into a town or city to sit at an office desk will dwarf the ever reducing extra effort needed to work remotely.

The future offerings of VDSL and beyond - even eventually to full fibre optic connection - will increase the desirability of remote working, whilst road and public transport congestion over the next decade will further enhance its desirability. So we can see that the technology is not the problem in this area. The problems we need to address – just like that MD – is people issues. He saw the opportunities for people to "skive", I see the majority of people having to be monitored for over-working. The two hours that used to be spent travelling to and from work are seen as part of the working day, and as such will continue to be included even though transportation is now not in the equation. We will have to start measuring performance by output and not by input and attendance!

The ability to "split-shift" becomes a pleasure if "clocking-off" entails only getting up from a desk and closing a door. Being on-call in an evening is not arduous if it can be done from your home. Work is becoming an activity not a place we travel to.

A Delighted Customer

What we must be striving for in the near future is a Delighted Customer. The creation of a good and sound working environment is just part of that greater goal. The customer

experience must be one of an easy and convenient conversation – a totally one-on-one experience.

If I feel that I was treated well, I will return. If I feel I have been treated shoddily I will leave and never return. I must feel that my interaction with a company is based on trust and appropriate use of the information that I have supplied.

That for example an experience that I had recently. A friend of mine wanted to buy a car and, as the motor industry does not have a good record for making female customers feel comfortable, I accompanied her to the car showroom during the process. Some months later I also purchased a car from the same showroom but a different sales assistant. A week after purchasing this vehicle I returned to complain that there were mechanical defects on my car and, during my conversation explaining these defects, the original sales agent rushed over to "remind me" that it would be my wife's birthday and he hoped that I had purchased a suitable present! This invasion irritated me on a number of levels:-

1) I was at the time complaining about poor service from his organisation and was not in the mood for sycophantic attentions,
2) I was not married to the woman in question – he should not be making assumptions without checking the facts, and
3) Her date of birth had been supplied as part of a financing deal and was inappropriate to be used in such a way.

In the electronic information age of the future, not only will we be able to collect more and more information about our customers, but we must also ensure that this information is completely correlated and used in a proper manner.

To find a customer takes months, to loose one can take seconds. Let's use the new technologies to ensure that our customers are delighted customers. We need to embrace the new technologies and marshal them as we engage our customers. And if you thought that technology has attained all that it can, think again! The scientists at CERN have just built the Haldon Collider – a machine that can produce Pita bits of information every second. (You are happy with Pita? No, well kilo is a thousand, Mega, Giga, Tetra → Pita, 10^{15} bits every second!) They are already creating networks (called the GRID) that can handle these amounts of information. Just like the scientists in the 1960s and 1970s they are creating the next Information Revolution. At the moment the systems are confined to a few academic institutions but they are heading our way. Do you think that you will be ready for them? Because just like the WEB the GRID is coming.