

Marshall Symposium Presentation

This is a transcript of my presentation at the Marshall Symposium in Ann Arbor, Michigan. The early reference to "people throwing things" was due to an incident in the early afternoon. There was an industrial dispute in the newspaper printing industry, and the CEO of the company involved was the chairman of my session. As he stood to start the proceedings – a riot broke out with people chanting and marauding around the large university auditorium. Imagine my surprise – being scheduled as the last speaker in the afternoon – to be put on immediately and without any warning! I walked to the front of the enormous stage and using a number of techniques subdued the masses – they became quiet and even started showing interest in the presentation. It was only when the leaders noticed that the technology I was describing was the very technology against which they were demonstrating – the riot re-occurred!

Good afternoon. Almost good evening now. Those of you who have read the program will notice I'm nowhere in there. That's for a very, very simple reason: What you are currently looking at is a three-dimensional moving hologram. That's why they put me on earlier; if they'd started throwing stuff, I don't care.

What I'm doing at the moment: I'm back at home in the UK. I'm still in my lounge, and the wall is a big screen, and you are all on that big screen. You believed such technology in "Star Trek Voyager," didn't you? Did you notice, though, that the hologram could only move around in the medical unit or in the holodeck? Even they have problems with the technology sometimes.

So, for a few minutes, let's have some fun with technology. Where's it going to go? Because my job in BT is a very simple one - I get to look into the future. What is going to happen in the future?

I believe that the historians looking back from the future will look back to the year 1998 as the year, the pivotal year, in the information revolution. As much a pivotal year as 1781 was in the mechanical revolution, when steam power and water power started. This is when it's all changing. Because what's happening at the moment, if you look at information, you get it from many sources. You get it from radio, from TV. It comes from satellites, over cables, over fibres, from the Internet, the intranet, the extranet, and all the other Nets we're going to have in the near future. Information comes via books, via magazines, via newspapers. And have you noticed what happens? Every single channel coming toward you is different. You have got to sort it all out. You have got to work really hard to get that information.

As an example, last Sunday, I bought a copy of the London Sunday Times. You now buy it by the pound. Fourteen sections this thing's got in it. The first one I picked was on culture.

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For crying out loud, I'm an engineer; phew - that's gone. The next one was on style and fashion - phew! After four hours of hard work, on Sunday afternoon, I'd found those two little postage stamps of information that I'm interested in.

It's going to get different. This is the year of convergence. This is the year when TVs start going digital, radios start going digital. Telephones have been digital for a long time, though you've never noticed it. And computers, CDs, have always been digital. It's all coming together. This is convergence. It's going to get simpler. The information tube is going to get a lot easier, and it's going to make a big difference to the way we look at our lives.

Looking just at your home. I see things changing very rapidly. I see chips getting so cheap they will be everywhere. For example, they will be on the back of the paper label that goes around the baked bean tin. You move around the supermarket with that trolley, you take the tin off the shelf and you put it in the trolley. When you get to the checkout, you walk past the checkout, and the checkout interrogates the trolley. It says, "OK, \$127.35. Yeah?" (There's a weighing scale underneath doing a parity check as well, just to make sure you haven't ripped the labels off.) You take your credit card, which is a smart card, you pay for it, and you take away the electronic receipt on the smart card and take your shopping home. Do you realize that those checkout people lift somewhere in the region of four tons a day, going, "Eek, cheeg, eek, cheeg" (imitating a cashier passing items over a scanner). We've lifted it out twice. We're lifting eight tons a day each. It's got to get simpler than that.

We conducted a trial about two years ago - Everybody called it a video-on-demand trial. It wasn't - it was an interactive information systems trial. We knew the equipment worked. We tried it in our own homes, very quietly, first just to make sure! We knew that worked. The aim of the trial was how the people worked. The technology (ADSL) passed down the telephone line two megabytes of information. And you could use the phone at the same time - which was the magical part - as you could watch off-air TV. Clicking one button brought up the information screen, and the one area everybody got excited about was the movie channel. Because if I'd run this trial - not just as a little trial in two towns with 2,000 homes, but nationwide, coast-to-coast in the UK - behind just one icon you could have a choice over 100,000 different videos. How on earth are you going to choose?

If we're going roll out that much information into your home, into the comfort of the sofa, we have got to give you an incredible tool of choice. Nothing comes simpler than one of these (holds up his index finger). Everybody I know can do, "Oh, I want that one over there." It's got to be so much fun getting the information today, you'll want to do it again tomorrow. We went elsewhere. We went into high-street shopping. We went into TV programs. We went into education. We went into access to City Hall and Town Hall. We even had one area here called Ad Land. It ran nothing but adverts, and people still watched them! (Some real weird people out there.) But it does beg the issue. If you can no longer take your products and services, turn them into an advert and put it into a TV program or into a magazine, how are

you going to do business? How are you going to lay your wares out in the electronic street corner and tease people toward you?

In the near future information is going to start getting very personal. Within 10 years, you will be wearing your computers. No, let's get real. Within 10 years, your computers are going to be wearing you as locomotion devices. (The only thing they can't do at the moment is walk around on their own.) Your clothing is going to start getting intelligent. I don't see a robot that puts your clothes in the washing machine. You're going to have to do that. But as you close the lid on the washing machine, the washing machine will interrogate the clothes, which will have the transponders (just like the baked bean tin) inside them, and it will reply, "Hey, did you really want to wash that red sock with all those white shirts and blouses?" And who hasn't done that? All right, which man hasn't done that? The washing machine will be intelligent enough to go out over an IT structure and buy electricity on the spot market. I did this sort of presentation about two months ago in the UK to one of the power companies, and at this point, the guy in the front row put his head in hands and made an awful noise. I just pointed to him and said, "You are the billings manager, aren't you?" Everybody else in the room laughed; he didn't laugh. He can't bill me by the month, and I'm talking about billing by the electron.

Amazing, Powerful, but let's go elsewhere in your home The thing in the corner of your lounge is no longer going to be a TV set, nor a computer, nor a games machine, nor a hi-fi, nor a radio. It's going to become an information portal, powerful enough to put different things on different screens in different rooms at the same time. And the screens aren't going to be the small, boxy, cube-like screens. They're going to be big screens, flat screens. The Japanese have just created a 110-inch flat screen. They cost \$2.8 million each at the moment. Buy a few; the price will come down.

Information will start becoming a virtual extension of your physical space. You will start relating to your information rather than scrabbling at the mountain that looks like it's about to avalanche on top of you. It's going to make a big difference to what you think of information. And inside this box, there are going to be artificial intelligent agents. Scary, eh? They're not artificial; they're not intelligent. These little packages are here to help you.

For example, you will have a TV watching agent. We just heard. In about two or three years' time, there's going to be about 4,000 channels of digital TV coming into your home. Are you going to read the program listing or what? The agent will sit next to you on the sofa. It will watch what you are watching. It knows your likes and your dislikes and your preferences. It will go to the database, sort and sift all information, and say, "Hey! You like science programs. Channel 734's got a new one. Are you interested?" And the information that's likely to be of interest to you will start getting pushed toward you, rather than you having to scabble at it.

You'll have other agents. You'll have a diary agent. It will sit there and say, "Hey, 4,000 channels of TV tonight. Half-past eight, still nothing worth watching though, is there? Oh, it's your brother's birthday - do you want to make a phone call? Do you want me to power dial it? Would you like vision?"

How about navigation agents? I live in the eastern part of England, and I want to go to Birmingham in the centre of the country. And the agent will know whether I want the cheapest route, the prettiest, and the fastest route. And cheapness is something. In the UK we're talking about toll roads for the first time ever. It's the only way we're going to get more cars on the road without pouring more concrete on the island. It's going to make a big difference to the way we start looking at information.

And the professor this morning started saying, "Command line editor. Editor. Browser." And he put 2008 question mark. I'd like to fill that question mark in. I think 2008 is going to be artificial intelligent agents that we start relating to. Because it won't be a case of typing into them. You will talk to them. And they will understand you. In the BT Labs we've already created a machine that does that. It recognizes any voice speaking English - only English at the moment; we're working on the rest -irrespective of age, gender, ethnic background, local accent, head cold, the lot. I can now talk to a machine and it understands me.

The next challenge is, it will talk back to me. We have built a machine that does just that. We're calling it Laureate at the moment. Any text inside the machine is read out in a very natural-sounding humanlike voice. Not that silly twangy American voice that we've always associated with computers. We're even putting in artificial intelligent agents that have natural language processing. We did one demonstration, we put into the agent all the 47,000 products and services from the BT catalogue. You can walk up to it and talk to it, saying, "Show me all the phones which are green and have liquid crystal displays." It goes to the database. It creates the data sheet on the fly. A little avatar (one of the virtual actors that looks like a real person) appears on the screen and talks to you, reads it to you. Then you can say, "But which ones cost less than \$20?" And it understands "which ones" as meaning the green phones with liquid crystal displays you were talking about recently. It's getting very, very conversational, just like talking to another human!

It's going to be so easy getting information. Just imagine in the next few years when you ring in to a company and you no longer get the, "For sales, press 1. For accounts, press 2. To hear the list again, press 99." You'll have a voice and it will say, "Which department do you require?" "Sales, please." "Connecting you." Just like it used to be in the old days, only you don't make a person sit there for eight hours a day plugging into a switchboard. It's going to be very easy. It's going to be a dynamic new way.

We're bringing all this together in a new desk we call Smart Space. I took it around the world with the BT Global Challenge (the round-the-world yacht race with 14 yachts - the World's Toughest Race!) and could have sold it hundreds of times over in each port of call! It has a

curved screen with multiple projections; it's got Surround Sound; it's got touch control; it's got voice control, and voice recognition. I started the bidding at \$10 million, and people were still interested. This is a demonstrator of the way forward where all your information is only a fingertip away.

It's going to make a difference to the way we look at work. Earlier today we had a number of people in here demonstrating their outrage that three years ago they went on strike and nobody noticed. Three years ago the Internet had not started. Why are they still stuck here? Why aren't they getting out into a new marketplace? Why aren't they actually undercutting the guy that they were shouting at? After all, he's not listening to them! They should be out in the new information era, on the Internet, undercutting him, getting into that new niche market. We talked about Amazon.com. A colleague of mine sits outside the Grand Hotel in Brighton (on the south coast of England) all summer long, with a tin full of chalks. He creates big pavement pictures. Puts a hat in the corner. Lots and lots of money goes through that hat. He's very rich.

But during the winter, sitting outside on the sidewalk in the UK is not a good idea. So he goes into the studio and he paints in oils. But he can't sell them. So we took a digital camera. It cost less than hundred dollars to set up a Web site. In the first six weeks he sold a whole winter's production in Australia. They like his paintings; I don't know why - they just liked his style! All of a sudden, a one-man business working out of a little lockup studio can take on the multinationals. And it's going to be more and more like this. Boundaries are going to disappear. Distance will become an irrelevance.

Earlier we were talking about translation. Only two weeks ago I was at a conference discussing machine translation. The conclusion was simply, "Not in my lifetime." The following day there was a knock on my office door. A colleague was there saying, "Look. It's happening. It's not perfect, but it's good enough. With a smattering of French you can work out why it made the mistakes." Suddenly it was there - a reality.

What we envisage is my sitting in the UK, creating a World Wide Web page in English. You sit in Germany. You pull my page up in Germany, and it appears in German. You didn't even ask for it to be translated, did you? The aim is to create almost a computer Esperanto. Create your Web page; it is transformed into a structure and syntax form which, although not understandable, can be instantly translated into all the other languages. At the moment we are concentrating on Western European languages. Then there will be a migration through Eastern Europe, and then hopefully the rest of the world as well. Suddenly the language boundary disappears. Commercial boundaries disappear. Sovereign boundaries disappear. You could work anywhere at any time that you want. And that's going to be the really big change.

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The one thing we mustn't do is be frightened by all this. The one challenge I have for you is not to work out what you want in information technology. Nobody cares about that. You have the ability to drive what you want into the Information Age.

But will everyone be able to cope? I have a challenge for you. I want you to take all this complexity of information technology and put it in a very specific lounge. A den. It's the den of Homer Simpson. I don't want you to excite him. I don't even want you to interest him. I just want you to put stuff in there that he can use as easily as a ring pull on a beer can and the on switch of his TV set. And it may just become something that's just there. Because people have got to see the value add in the technologies before they will take it on board. Until they can see some reason for doing it - makes their life richer, faster, more fun - they're not going to take any interest at all, and what we've got to do is roll it out and make them interested enough to want to use it. Convergence is upon us. The question is, how do you want go forwards into the information age? And how do we take others into the information age, seamlessly and painlessly, and make them enjoy it? Thank you for your time.