



The Digital Home Interview with Bill Gates

Microsoft has christened this the digital decade and key pieces of that vision are starting to arrive, such as Media Center Edition and the Media Center Extenders. All this puts the PC firmly at the centre of the digital home, connecting to your TV, your car and even your watch. We asked Bill Gates how it's all going to come together

What do you mean when you call this the digital decade?

What we mean by that is that activities like listening to music, organizing your photos and buying products will be dramatically driven by software in a way that they were not at the start of the decade.

People have been talking about convergence between multimedia devices and digital content for a long time. Why is it only really happening now?

The hardware advances are very important. It's this that created the PC. In the '90s we achieved the graphics interface. We got connectivity, and the whole internet explosion took place. Now we have so much highly capable hardware, we need wireless networking. Why can we say that all your audio will be available on any speaker in the house, and all of your video will be available on any screen? It's because the wireless network will deliver it. Similarly, hardware connectivity through USB is another important element. The PC gets richer because we connect it up to devices either through wireless, through the Ethernet, or through that USB capability. The fact that the computer turns on quickly and the network is always there, we think that that really changes the way you think about these things.

Where else do you see hardware advances taking place at the moment?

There are a number of areas... For example, the Portable Media Center is going to not just have your music on it, but your movies as well – you just find it on the web and download it. That's because hard disk drive capacity has grown, battery life has improved, and LCD screens have got cheaper. You can look at flat screen TVs and say, wow, that improves the TV viewing experience. You can look at digital cameras and say, that's becoming mainstream. You can look at the rise of broadband and how it connects up these devices to all the information in the world. Every one of these is moving at an incredible speed and are driving portable computing forward.

Even with all these advances in hardware, for the PC to become the digital hub of the home, it's going to need to develop. What changes will we be seeing?

With hardware you're going to have lots of variety. There will be devices designed for the wrist, the pocket, the tablet, the desk or the wall – and the TV's a sort of wall, although the wall at work and the wall at home are different. And then there's the car which is a unique environment because it's important that the driver shouldn't be distracted. Integrating people's information needs across all these devices so people can get the information when they want it... that's the theme.

What will this mean for the desktop PC as we know it?

The personal computer in less than three years will be a phenomenal device. The graphics capability, some of which we have in today's machines, but which isn't necessarily being exploited by all applications, will be even better. The memory, the speed, none of these things are the constraint. In fact, I think it's simple to say where the constraint is in this era... It's not the microprocessor, and it's not the cost of networking. Here, it's software... we need software that is managing itself, software that's reducing the complexity and getting the platform to be rich enough so that this all comes together.

Can you expand on the idea that software development will become increasingly important for the digital home?

The home is going digital. First we go from analogue formats to digital stored media formats. Then we go to taking the digital format and storing it on a disk, where it's in its most flexible, most portable form. The transition in the case of audio is overwhelmingly to the digital form. DVD players for movie playbacks have been a runaway hit. The idea of downloading movies through Movie Link and Cinema Now is just catching on as the availability gets stronger, so we're partnering with them to do better software. The camera is there, the growth is explosive: 105 million digital cameras worldwide. That's 34 per cent growth versus analogue cameras which are showing no growth at all. But we still have frustrations to address... How do you search for things? How do you find the music that your friends like? How do you organize it? The hard disk and software can solve that. How do you find something obscure that you might be interested in? That's a serious challenge. So software on the PC and software that connects through standards with these devices can solve those problems to enable people to consume content, interact with content, share content and have new forms of entertainment. The software is the key for powerful devices to work together... with a hard disk being kind of the hub of all these activities.

Which is where the PC Hub comes in...

That's the philosophy behind Media Center. It's about connecting all the devices. One of the big limitations of the PC was that you had to sit down at the keyboard. It was always set up so one person at a time would be connected up there. What Media Center did is it said, no, I can use this remote control, I can use this simple interface, to get to all my media activities.

How do you see the development of HDTV?

One of the media formats we support on Media Center, and that we support on all devices, is the Windows Media Video. The latest incarnation is the high definition form of that. High definition is at the beginning. As the price of the devices come down and as the distribution gets there, this is something we all want to be pervasive. That's why we have this format and we're building it in to PCs. It's very high quality and it's not just in the video but also in the audio. So at the same time that we're giving people more flexibility in dealing with media, we're also raising the quality as well. The digital world will be a world where the quality of phone conversations, the quality of music and the quality of video actually gets to a level that it's so good that any additional improvement wouldn't even be appreciated. It really is getting to be the best it possibly can be.

You're going from the big screen, with TV, to the smallest screen you can get with watches. What's the idea behind SPOT? When will we see it in the UK?

The idea of SPOT technology is low-cost chips that receive information to be used in devices like a wristwatch or an alarm clock. Sitting here on my wrist is a device that's about four times as powerful as the IBM PC. By downloading .NET code to it we can enhance the applications to enable things like showing a sports game in real-time. It's a very flexible, programmable platform and even from the beginning we've got news from great sources (the Wall Street Journal), weather, or a calendar that you can set up online to bring down to the watch. All I have to do is go on to the web, use an account and type in the watch registration number and then I pick any one

of these channels. The MSN Direct network connects us to our SPOT watches. The network is in the hundred largest metro areas, and we'll increase this by partnering up with FM radio stations – it's their antennas that give us that data connectivity. We're bringing SPOT to the UK within a year.

It sounds like the PC could just fade away...

Well, paper hasn't faded away; you now take it for granted but it's still there. So the computer will still be there, but it will be a real tablet that will become lighter and thinner; it's common sense that that's the way you do things. If you have a device that can fit in your pocket, you can pull it out and look at a map, or look at your schedule, or see anything that's urgent according to the criteria that you specified. This could be not just mail, but stock prices or business developments, or any of those kinds of things. You will take these things for granted, in the same way that you didn't wake up this morning and give thanks for electricity.

The fact that you can now go on to the web and get information straightaway – that's such a change but we just take it for granted. Imagine a friend tells you about their medical condition, you'll want to be able to go to the web and learn about it. You stay in touch with people in faraway places via email. There are so many things we'll take for granted about music, photos, buying, selling, meeting, note-taking, sales analysis forecasting, and personnel reviews; all these processes will change to just using the digital tools. You always triumph where people take things for granted. If you take our previous triumphs like the graphics interface it was very controversial, as many people thought it was too slow. Then almost overnight it was taken for granted, and actually we're not going through that same resistance with Web Services, as people actually see the need; this is a revolution that's had less resistance to it than some of the previous ones.

Going back to your earlier reference to the car. Is this a serious business strategy for Microsoft? And if so how will you place technology into the car safely?

The car is a challenge in that you don't want to distract the driver. The idea of having directions that you've looked up on a PC or on a phone, having those available to you through a map or an audio readout – that makes sense. Having access to any new tunes that you have at home or videos for the passengers, particularly the kids should all be very automatic. And after all, when your car is parked up at home it's now generally within range of your Wi-Fi network, and so just by having a receiver you can make it so that you don't have to do manual synchronization. Even if you're listening to, say, a radio show, you ought to be able to have the rest of the program streamed down to the car so you can listen to it on demand through a rich device in the car.

Speech recognition will obviously be important for controlling in-car entertainment in the future...

Today we don't have speech as a way of interacting with these devices. Certainly in the car, speech is going to be, for the driver, the primary way to provide input. And so we have to drive speech technology forward. We have to put it into the mainstream. That means we can have it on all the devices. Once you train your computer to understand your voice, then automatically your phone will see that profile and it will be there. Your car will see that profile. The types of things you talk about, the words that are typical, will be picked up, so even on an ongoing basis, without your having to do anything explicit, the experience will get better and better.

So speech recognition will become increasingly useful throughout all aspects of the digital home?

I think the real harbinger of the future is what has happened with Xbox Live. This is a case where we assume broadband, we said, hey, let's connect it up, let's write the games so people can play with each other at a distance and by assuming broadband we'll let people talk to each other. Well,

that idea of chatting while you're playing has meant the focus in some cases isn't so much on the game as it is on the social experience, and so people are even coming to us and saying, well, can we chat while we're watching videos, can we chat watching channels and doing a variety of things? Voice recognition will be hugely important as an input type – it will be there in every one of these devices over time.

What can the industry do to help protect copyright in this digital age?

When content becomes digital, it's easier to copy. The perception that MP3 is all about stealing music is only changing slowly. There's the worry that legitimate digital content will be so controlled that it won't be useful, that the users are being treated as potential thieves. Is that going to hold things back? Will you have to start locking PCs down? We have to be careful about all the boundaries between these devices and a particular challenge here is to make sure that we strike the right balance in managing digital rights while offering simple solutions so you can move the content that you paid for around and have it available in the richest possible way. It's a very tough problem. There'll always be piracy whether it's software or music. The goal should be that it doesn't keep going at this current level which would make it very difficult for artists to do the creative things they do.

Is the industry doing enough to tackle the situation?

I believe that creative people ought to have both incentives and rewards. If people aren't respecting that, they'll find some way to steal the content no matter what goes on with the technology. What the technology can do is to remind people what the rights are in a framework where it's very easy to do legitimate licensing.

The music industry didn't come out with legitimate licensing as early as they should have done. And perhaps belatedly, they're coming out with music downloading and that's great. We are one of many companies that will facilitate those things, so that whenever you hear a tune on the radio you can just click and buy it. A step forward has been taken in terms of the licensing and the software interface. But there'll always be a reliance on a certain level that, "Hey, if I'm listening to this guy's music I want to contribute to his economic success as well."

Finally, Longhorn is a big step – but is it a big gamble as well? Is it the last version of Windows?

Certainly it's a big gamble, with all our credibility and our developer energy. Developers are pragmatic and they need to keep licensing coming in, so many will divide their time between upgrading the things that they already have, and working on Longhorn.

It's always a minority of developers who drive the new platform; when we first released Windows 95 most people were running 16-bit and DOS applications. It's easy to forget today that in Windows 95 half the users were spending half their time in character mode still, because they were used to it. So even with Longhorn we have to add value to existing applications. We need ways that you immediately get the benefit without buying new applications. But this is a bootstrap process. When Longhorn comes out it won't be on every machine overnight; we'll be going well to get the uptake we've had with previous versions because it is such a big leap from what people are used to. Windows XP had a very quick uptake, partly because the compatibility was strong at the application level; the device driver level was a painful transition to go through but we needed to get things up to that level. This is the big release this decade – all the releases for the rest of the decade will be refinements of this.

What to do next?

The primary goal of our whitepapers is to educate. We ask and hope that you will share this information with others. If you need help with our digital home or have any questions then schedule a free consultation.

Our consultants primarily serve the Connecticut and New York marketplaces. Our focus is on small to medium sized companies in addition to home services for executives, telecommuters and anyone with broadband "always on" connections.

Initial consultations are scheduled with a Zeleration senior or junior partner who has a personal stake in the firm. Our goal during an initial consultation is to evaluate and propose solutions to computer problems. Approval of our estimates to complete work is required before work begins.

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