

Smart surroundings

It's not just our office and home computing setups that have got sleeker and smarter. Formerly mundane household objects are now style icons in their own right, with many gadgets performing amazing electronic feats. Wendy Brewer steps across the threshold and enters the intelligent home

The intelligent home concept has always had its roots firmly planted in science fiction. Think wives communicating with their working husbands via toasters, robots doing the laundry, feeding the dog and cooking the dinner, and self-washing cars.

Okay, so we'd be lying if we said manufacturers had reached this pinnacle in home applications. It would be more accurate to say they're starting to dip their toes into the pool of possibilities.

But despite many devices being confined to the design stage by today's glum economic climate, several companies are spending the time and energy required to introduce their developments into the consumer forum. The realisation of a responsive, intelligent, *Jetsons*-style home is therefore moving a step closer.

Central command

Manufacturers are torn in their opinion of what will triumph as the central operating hub of our smart homes - the device that will control all the other integrated gadgets and peripherals. Sony is backing the TV while, predictably enough, Microsoft is gunning for the PC.

Takeup figures for digital television are looking healthier, with around 40 percent of

the population having made the switch. But well over 60 percent of UK households own a PC and nearly half of us are already using it in conjunction with an array of connected peripherals. For the time being at least, this seems to put the PC in pole position.

HP, Time, Evesham and Packard Bell are among a handful of manufacturers that have teamed up with Microsoft to produce Media Centre Edition PCs. These systems are designed as entertainment centres, allowing users to play and edit DVDs, download music tracks to MP3 players and even create films.

Research conducted earlier this year by Forrester revealed the largest increase in home PC usage centred on entertainment, with 44 percent of owners listening to music on their PCs, 40 percent viewing photos and 21 percent watching DVDs. Forrester predicts that our increasing demands on the humble PC will drive up the sales of so-called 'pleasure PCs' over the next five years.

This tug of war between the TV and the PC looks set to continue, with manufacturers championing their own technologies. But as long as companies continue to develop applications for both devices, it's up to the consumer to choose which they feel more comfortable with and, primarily, which they can afford.







Ambient effects

Taking it one step further, a handful of manufacturers have built their own versions of the all-singing, all-dancing smart home. The idea is to prove that anyone - with a sufficiently large bank balance, at least - can turn a run-of-the-mill semi-detached house into a fully networked home.

The majority of manufacturers, including Orange and HP, have chosen devices that are readily available and relatively affordable. Designs from electronics giants Sony and Philips, on the other hand, include expensive gadgets such as mood-altering lights and giant mirrored plasma screens. The general theme, however, is the same in most of the showhomes: integrated, intelligent, ambient devices.

"To reach a world in which ambient intelligence is pervasive, we need to teach technology to react to humans rather than forcing humans to program technology," says Erkki Liikanen, EU commissioner for enterprise and information technology. It is this idea of 'ambient technology' that has formed the backbone of Philips smart homes across the world, including its latest venture which was built in Singapore back in June.

Philips' vision is a customised home programmed to meet the needs of individual family members. Each person in the house is equipped with a smartcard on which they save details such as their preferred internet settings, work and home email accounts, favourite TV channels and so on. The card slots into all the

household devices, logging a user straight into their personalised setup.

The 'Follow me' TV feature means viewers can continue watching a programme uninterrupted when moving from room to room. A time delay function records the show as it is being viewed, pauses it when a viewer leaves a room and resumes play when they reach the next one.

Philips' HomeLab in Holland gives visitors the opportunity to experience some of these ambient technologies firsthand, including TVs that respond to human voice commands and create digital fantasy environments for virtual reality games.

"The HomeLab enables us to observe people experiencing technology and new products in the context of a normal home. As a research facility, HomeLab will provide us with a wealth of information about the needs of consumers," says Philips' president Gerard Kleisterlee.

Stay cool

HP's offering, Cooltown, was built in Wokingham, Berkshire last year. The £7m research facility was set up as a development platform for pervasive computing. Although the house is more like a showroom than a traditional home environment, it allows visitors to experience some of the benefits of the connected abode such as internet radios and wirelessly controlled home appliances. Standard barcodes, infrared, radio receivers and Bluetooth wireless technologies are used to transmit information to handheld devices.

The ultimate des-res: the Orange smart home in Hertfordshire, above; the Philips HomeLab in Holland, top right; HP's £7m Cooltown, above right

In the not-too-distant future, HP predicts that all clothes will have smart labels capable of telling washing machines how they should be washed. All posters and adverts will contain barcodes that can be swiped. The information will be passed via the internet - for example, to cinemas allowing us to book tickets. Or we could instantly order whatever goods or services the advert displays.

For HP, mobility is vital, because the more tasks we can carry out with one mobile device the better integration our lives will see.

The future's Orange

Orange was one of the first manufacturers to set up a smart home in the UK. The £2m Hertfordshire home, opened on 1 August, is now a learning experience for schoolchildren and businesses in the area

At the heart of the house is the control centre which manages the commands administered by users

Networks get smart

Scientists at Intel are developing mesh networking technologies that would allow wireless computer networks to organise themselves and manage data traffic levels without the need for human intervention. Although it is still in the early stages, if the research proves successful it may not be long before we see homes dotted with smart wireless relays that shuffle data around at high speeds. The advantage of mesh networks is that they do not require a central hub or access point to send the data between the network and connected devices.

through a series of wireless technologies, speech recognition and broadband internet. This 'engine' allows the behaviour of the house systems to be modified and controlled according to the rules encoded in the engine. The command router then sends user requests to one of two controlled sub-systems that operate the various components in the house.

Orange has considered every detail right down to automatic door locks controlled by remote wireless key fobs, or mobile phones and passive movement detectors to automatically lock the bathroom door when movement is detected inside.

Well, wired networks offer much faster speeds than wireless connections, reaching up to 1,000Mbps (megabits per second). They also provide a larger communication range - 300 feet with an ethernet connection or up to 1,800 feet with fibre-optic networks.

Wired, at least for now, also gains points for ease of installation. Wireless setup procedures and devices are simply too complicated for the average user, according to IDC analyst Jason Armitage. There are also a few niggling security concerns about wireless networks that may deter many consumers. After all,

Wireless specialist Linksys offers a range of hubs and access points for under £400. Its WAP54G access point runs on the 802.11g wireless standard and supports earlier wireless versions. The company also offers cheaper accessories such as its wired-to-wireless bridge, which turns PS2 and Xbox games consoles into wireless hubs for just £65.

Wireless cards have traditionally been an expensive option - until the launch of Intel's Centrino chip earlier this year. The technology on this wireless processor gives many notebook owners affordable access to wireless networks. Importantly, it's now within the price bracket of most consumers.

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These are just a few examples used to demonstrate technology working around humans, with little or no need for programming.

Wiring up

Let's face it, if you want an intelligent home you need a broadband connection as dialup internet access simply isn't fast enough to run the required applications. But this is only the first step. Once you've shelled out for high-speed access - usually between £20 and £30 per month plus installation charges - you'll need to invest in a home network to enable your digital devices to communicate with one another. Here you have two options: wired or wireless.

Built-in wired networks are gaining popularity in households, with planners designing new homes around the technology. But let's not get overexcited here: take-up of home networks isn't exactly widespread. Research firm IDC estimates that only around one million European households have installed a network of some kind. By 2007 it predicts 14 million homes will be networked - still a surprisingly low number. And when we do finally take the plunge, how will we know which network to choose?

once we start relying on our home network, we can't risk it being open to hackers and virus writers.

Cut the strings

Wired networks are at the forefront right now, mainly due to the fact that only the most technically savvy would attempt the complicated, arduous task of installing a wireless network. But over the next few years it's likely that wireless access points will become more prevalent and perhaps take over as the main network connection in the home.

Cable provider Telewest launched the first self-install wireless pack in August, priced at a tempting £35. The device is based on a preconfigured Netgear access point connected to a cable modem built into the company's set-top box. But this isn't a fully wireless offering. Users are confined to the communication reach of their set-top box, which generally means the lounge, so it's more a case of fewer wires than wire-free. Likewise, BT's Home Network 1200 hub, which costs around £170, demands all connected computers and peripherals are within a reasonable distance of the connection sockets, rather limiting your freedom to roam.

Home help

There are two distinct categories of intelligent devices emerging: those designed for our entertainment needs and those intended to simplify household chores.

Korean electronics giant LG has been pushing its intelligent products for some time. The company's internet fridge provides owners with web and email access - perfect for

LG's internet fridge keeps an eye out for mouldy food





ordering the weekly shopping or alerting users when food is out of date. It even tells its owner when it needs maintenance. But at around £4,000, only those with money to burn will be installing this fridge anytime soon.

The premise is that, eventually, the homeowner will be able to control every part of the networked house externally via an array of mobile devices. LG's remote air conditioning system, for example, lets you turn the heating up or down while you're still in the office. So by the time you get off the train from work and reach the front door, every room will be at its optimum temperature.

A must for any intelligent home is Electrolux's Trilobite, the world's first automatic vacuum cleaner. The cylindrical device is sensitive to its surroundings so it can be left to clean a room without knocking over a glass of water or a pot plant - more than can be said for the average human operator. If it gets tired, Trilobite simply plugs itself into its battery port and recharges.

Let me entertain you

The most exciting developments are in the entertainment sector, where consumers have generally been more willing to pay higher prices for technological advances.

It would be impossible to talk about home entertainment without

mentioning Japanese behemoth Sony, developer of some of the coolest television sets and stereo systems on the market. Its network media receiver, launched later this year, will let consumers link up their PCs, hi-fis, notebooks and PCs. This means content from one device can be streamed to another, so you could watch a slideshow of holiday photos on the TV or play digital music downloaded to a computer through the home stereo.

Sony's Cocoon Home AV Gateway, currently being tested by Japanese households, includes a home theatre system with built-in hard drives and an intelligent DVD player with recording and editing facilities. Using wireless broadband connections, all devices communicate with each other requiring little human interaction.

It's not clear whether the Cocoon range will ever reach our shores. Even if it doesn't, the project marks a major step on Sony's path to the ultimate smart home.

Meanwhile, Philips has placed integration at the top of the list for its Mirror TV. Designed to look like an ordinary mirror, the device uses a unique polarised technology that transfers nearly 100 percent of the light through the reflective surface, so you can brush your hair and watch TV at the same time.

Philips is also developing packages that could be used with the television,

such as daily news bulletins or cartoons. Unfortunately a price hasn't been released but we'll hazard a guess it's not going to be cheap.

Tablet PCs: easy to swallow

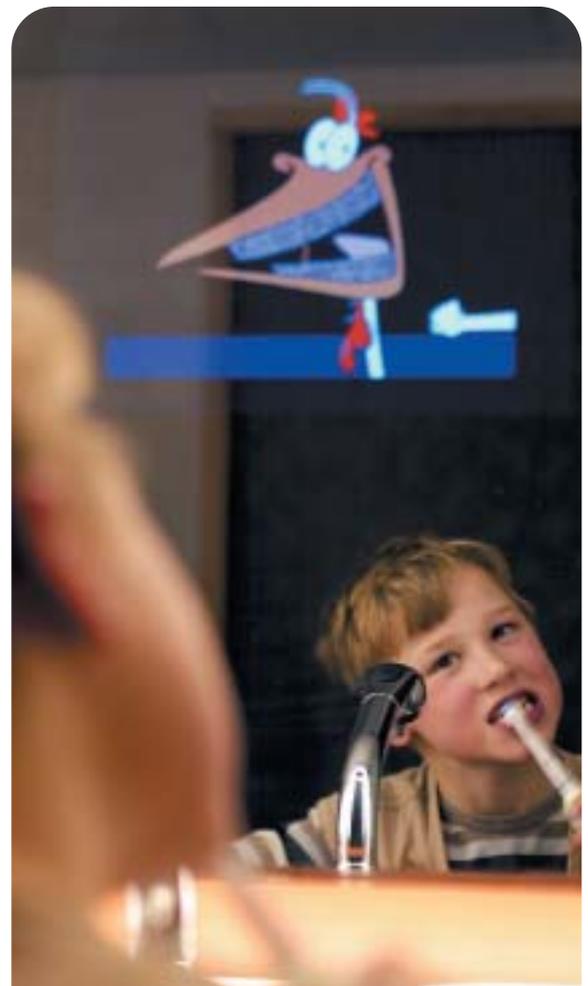
Despite extremely poor initial sales, most vendors are still convinced that the tablet PC, in some shape or form, will act as the control panel for the intelligent home. Analysts at research firm Canalis have put this slow takeup down to buyers' unwillingness to trade performance for increased mobility.

Others have blamed the general lack of support from key players such as Dell and IBM. But in principle, the tablet PC makes a lot of sense. Its portability, notepad/pen functionality and ease of use are second to none.

A mid-range tablet PC such as ViewSonic's PV1100 will set you back around £1,000. Offering built-in support for wireless, wired and dialup networks, the device can be used in conjunction with other networked devices around the house. However, compatibility could be an issue between different brands of device.

Put your feet up while the Trilobite does the vacuuming

In the Philips' HomeLab



Philips has come up with another device based on the tablet design: the iPronto. Described by the company as a 'comprehensive dashboard for the digital home', it has a 6.4in touch-screen LCD, a customisable user interface, and can control several devices around the home.

Since iPronto runs on broadband, new services and applications can be emailed directly to the control pad

Working Group), a non-profit organisation designed to simplify the sharing of digital content.

The aim is to deliver technical guidelines which allow companies to develop products that share content through wired and wireless networks in the home. "Our mission is to provide easy-to-use products that are an integral part of people's everyday lives," says Pertti

Since iPronto runs on broadband, new services and applications can be emailed directly to the control pad with no need to download or upgrade

with no need to download or upgrade. As well as a comprehensive TV guide with intuitive recording, users can access emails, surf the web and check the operational status of devices connected to it.

A similar offering from Sony is its webpad TV remote. Originally developed by Microsoft under the codename Mira, it can operate as an independent webpad for internet and word processing applications or as a remote control for the company's KDE-P50H1 and P42HZ1 plasma screens - due for release in the UK later this year.

The 15x9cm display is about the same size as an average laptop, offers similar picture quality, has controls overlaid on the screen and can recognise gesture-based fingertip strokes.

Singing the same tune

The main barrier to the adoption of the digital home is a lack of compatibility between devices. Manufacturers seem to go out of their way to create their own standards, forcing consumers to buy only their products or to face hours of frustration trying to get incompatible machines to communicate.

A digital home should be simple - plug and play is key. Recognising that simplicity sells, 17 industry heavyweights, including Sony, HP and Microsoft, have joined forces to create the DHWG (Digital Home

Korhonen, executive vice-president of DHWG member Nokia.

Whether or not the group will live up to its promises remains to be seen. Manufacturers are traditionally reluctant to give up their proprietary standards, but the DHWG is certainly a step in the right direction.

Happy gardening

Technology doesn't end behind closed doors. The main benefit of a networked home is being able to control what's going on outside the



Webpads and Smart Displays from top: two views of the Philips iPronto; ViewSonic's Airpanel; inside the Orange Home

Talking devices

Voice-recognition technologies have progressed significantly over the past few years and affordable software such as Dragon NaturallySpeaking and IBM's ViaVoice is now commonplace on many home PCs. But voice commands in intelligent household devices are few and far between, with manufacturers apparently ignoring this important advance in interaction.

But there are good reasons for this omission. First, all devices must use the same voice control interface to communicate with one another, which would require manufacturers to work together to create universal voice standards. Second, voice-recognition packages require hefty processing power which immediately pushes prices up.

However, US speech-recognition company Voxi is currently developing a wireless Bluetooth solution that integrates microphones with a speech-recognition server. A portable wireless device known as the SUU (speech understanding unit) searches for all voice-operated Bluetooth devices in the vicinity. Each appliance is equipped with a list of words that can be used to control it. The SUU can understand and execute commands. This would mean that wherever a voice-operated Bluetooth device is located, even in the car, the SUU could automatically configure all the other household devices to communicate with it.

There is currently no specific date for the availability of such technology but it's unlikely to be an affordable consumer solution for at least the next two or three years.



Are we ready?

Universal adoption of smart devices is gathering pace. Most of us have already purchased PCs, digital cameras, smartphones and laptops, so the idea of networking everything in our home to one central hub no longer seems like science fiction. It's only a matter of time before most of us start upgrading our homes to match our newly acquired 'techy' lifestyles.

In truth, though, a fully integrated networked home will require an unprecedented level of co-operation between content providers, product manufacturers and network operators. It's hard to envisage the likes of big players such as BT, Microsoft and Sony sacrificing their proprietary standards for the benefit of the whole.

If the DHWG does manage to achieve unity on standards, consumers will feel more at ease purchasing a range of devices. Increased competition also inevitably leads to cheaper prices.

But poor sales across the technology market over the past two years have had a detrimental effect on the creativity and innovations of many companies, which are choosing to focus solely on their core market in a bid to sniff out profits. Our future lies in the hands of the industry heavyweights, and without agreement we could be waiting some time for our intelligent homes. ☒

house from watering the garden to keeping an eye on the parameters of your property via a webcam. But when it comes to looking after the garden human intervention is a certainty - unless, of course, you fancy treating yourself to a robot lawnmower.

Robomow RL500 is a fully automatic, rechargeable lawnmower. Simply place Robomow on the lawn and press go. It works out the dimensions of the lawn and starts cutting. Best of all, the mower munches the cuttings into tiny pieces and then drives them back into the lawn. Once Robo has finished, simply use the bundled remote control to direct it to the shed for a recharge.

Multimedia on the road from Daimler Chrysler

Digital lifestyle on the go

Connectivity is as important outside the house as it is inside it. Sales of smart cars look set to gather pace over the next few years as more people demand the conveniences of their digital home while on the move. In Japan, most cars are already equipped with dashboard navigation systems and DVD players. But Japanese company Clarion went one step further with the launch of the Cadius earlier this year. This car offers all the above features, plus internet access, a WMA digital audio player and an MP3 player.

Less adventurous applications can be seen in Audi and Daimler Chrysler's GPS (global satellite positioning) systems, UMTS mobile services and Bluetooth hands-free kits. "Multimedia solutions will soon be a fixed part of a wide variety of everyday situations," says Timotheus Höttges, chairman of the management board of T-Mobile Germany, which partnered with Daimler Chrysler's UMTS venture.