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## Home is where the future is

Sep 16th 2004

From The Economist print edition

Consumer electronics: What ever happened to the dream of the smart home—and might it finally have taken a step closer to reality?

THE idea of the smart, automated home of the future has a surprisingly long history. As early as 1893, *Answers* magazine enthused about the electrical home of the future, "fitted throughout with electricity, electric stoves in every room...all the stoves can be lighted by pressing a button at the bed-side...doors and windows fitted with electric fastenings". By 1959, the designers of the "Miracle Kitchen" that went on show at the American National Exhibition in Moscow promised that "household chores in the future will be gone for the American housewife at the touch of a button or the wave of a hand." Modern visions of the smart home feature fridges that propose recipes based on available ingredients, cupboards that order groceries just before they run out, and various internet-capable kitchen appliances. Despite all the hype, however, the home of the future has resolutely remained just that.

Yet the idea refuses to die. In Seattle, for example, Microsoft's prototype home of the future is so thoroughly networked that when you ask for the time, the house answers, and when you put flour and a food processor on the kitchen counter, it asks if you would like to make some bread and offers to project the recipe on to the counter.

Over at the Massachusetts Institute of Technology's Media Lab, Ted Selker and his colleagues are experimenting with a smart spoon. It has salt, acidity and temperature sensors, and can even understand what it is stirring. "This spoon is basically a tongue," says Dr Selker. Using a simple display, the spoon advises you when, for example, you put too much salt or vinegar in the salad dressing, or your pudding is too hot. Counter Intelligence, another Media Lab project, uses talking ingredients to walk you through the preparation of various dishes. Dr Selker's group is also working with Stop & Shop, a retail chain, to develop handheld computers that help shoppers find the ingredients they want, and then suggest ways to prepare them.

Meanwhile, at Accenture's Sophia Antipolis laboratory in France, researchers are developing a device called a "persuasive mirror". Why persuasive? Because it does not reflect what you actually look like, but what you will look like if you fail to eat well and exercise properly. Accenture's researchers are also dreaming up ways for the elderly to share digital scrapbooks online with their grandchildren, and smart systems that talk you through simple home-improvement tasks, such as installing a new light fixture.

Clearly, the dream of the smart home is alive and well. Indeed, the spread of broadband internet links, mobile phones and, in particular, home wireless networks over the past few years has led some people to conclude that the dream might even be about to become a reality. "The thing that has changed over the last five years," says Franklin Reynolds of

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How the future used to look

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Nokia's research centre in Boston, "is that five years ago we talked about all of this and there didn't seem to be any movement in the marketplace. Now I see a hint that things are changing."

Wireless networks are a key building block for smart homes, since they enable devices to talk to each other, and to the internet, without the need to run cables all over the place. Always-on broadband links help too, since they enable appliances to send and receive information whenever they want to. Wireless chips embedded into every device could transform an ordinary home into a distributed computing system. "The era of the stand-alone device is over," says Jonathan Cluts, Microsoft's head of consumer prototyping and strategy. "Soon, you literally won't be willing to buy anything that doesn't somehow communicate with the other things in your home or your life."

Proponents of the smart home are also heartened by the proliferation of mobile phones, which are now the world's most ubiquitous digital devices. Nokia, the world's largest handset-maker, hopes to turn its tiny phones into universal remote-control devices, able to control everything from the television to the lights to the microwave. "It's the Swiss Army knife approach," says Mr Reynolds. "After all, everyone—in our dreams at least—carries a mobile phone around with them." You might, for example, use your mobile phone to turn on the heating while you are out, or check the view from your holiday home's security camera.

But there are still several large obstacles to overcome. The first is the challenge of making devices easy to use and simple to connect to each other. The aim, says Mr Cluts, "is to keep you free from thinking about the technology." Robert Pait of Seagate Technologies, a maker of hard disks, says that will not happen until technology companies shift the burden of learning from consumers to machines. "Humans should be able to intuitively tell devices what to do," he says. "Today we're all on a sharp learning curve with almost everything we buy."

Agreeing on standards will be just as much of a challenge. The smart home will remain out of reach as long as devices from different manufacturers cannot talk to each other. For a start, that means agreeing on a wireless-networking standard: but there are several rival technologies. HomeRF, once touted as the ultimate home-networking standard, has been wiped out by Wi-Fi, but newer technologies such as ZigBee and ultrawideband are now in the running too. ZigBee is good for low-speed, low-power transmissions (automated meter readings, for example), while ultrawideband is ideal for linking up home-entertainment devices, though it is currently mired in a standards war (see article).

But several standards initiatives are afoot, says Brad Myers, who is in charge of the Pebbles project, an effort at Carnegie Mellon University in Pittsburgh to streamline the connectivity of home appliances. The Universal Plug and Play Forum, for example, aims to encourage "simple and robust connectivity" between devices from different manufacturers. The Internet Home Alliance, which has the backing of companies such as IBM, Microsoft and Whirlpool, is also working to improve connectivity between household devices. And in Europe, 168 companies have joined the Digital Living Network Alliance to streamline communication between PCs, handheld devices and home entertainment systems. "We're making progress," says Dr Myers. Perhaps believers in the smart home can take heart. For even a standards war is a step forward, since it suggests that there will, someday, be a market worth fighting over.

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Massachusetts Institute of Technology's Media Lab posts information on its intelligent spoon and counter intelligence projects. See also the Internet Home Alliance and the Digital Living Network Alliance.

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