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Banter

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Highlights

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CONVERGENCE OF TECHNOLOGIES AND TERMINALS: WILL TV REPLACE THE PC? AN ARGUMENT

by Jason Ross

Dealing with content production, as we are today, demands a close look at the consumer's perspective, particularly, at what kind of devices people will be using in the future to view programming and other forms of content. This raises the issue of convergence, 'will TVs replace personal computers?' For those of you who want to get to lunch fast, the short answer is no.

Convergence is not a new debate. It is almost ten years since futurist George Gilder described his concept for the 'teleputer' in Forbes magazine [1], a hybrid interactive video and telecom device. The teleputer was set to replace the TV and the telephone, and give users access to a vast international network of connected devices; all this at a time when email was largely an academic resource.

Since then, the debate has swung both ways and champions have risen and fallen on each side. Four to five years ago, web pundits were loudly proclaiming the death of TV, or at least a radical reassessment of TV-advertising revenue models. This point of view has continued to thrive today, fuelled by improving flat-screen technology, fatter pipes, and suggestive moves from players like Sony to quietly incorporate TV decoders into their latest VAIO MX laptops. Just last year, you could read headlines like this one in the Digital Television Group's Digital News: 'TV is dead, long live the Internet' [2]. All over Europe and North America, companies like AOL, Microsoft and Dell thrived as consumers turned to PC based networked devices, convinced that the revolution would not be televised.

The opposite point of view, that TV will replace the PC, has been championed mainly by media pundits, encouraged by TVs becoming networked and taking on some of the more basic characteristics of PCs. In these scenarios, TVs either gained their own hard drives or network speeds got faster than an internal PC bus, rendering the PC storage trump card obsolete. Either way, the PC lost its independence and became a client to a network or home 'hub', usually either a TV or some form of Microsoft 'Next Box'.

The debate is now so well trodden that it has entered the strange and wonderful land of consumer promotions. In December 2001, PCWorld ran an article warning,

Don't look now but your PC is trying to replace your TV and stereo system. And new devices

for your living room are homing in on your PC's turf [3].

In this complicated confusion of devices, channels, technologies, and agendas, what can we do here to shed some

light on the perennial topic? Is there anything interesting left to say in the debate or is it time to sit back and see what happens? I hope you will take the fact that I am here to mean that I

believe there is something interesting to say, but getting to this demands that we shift our perception away from technological determinism to a more humanistic view.

Social lives and things

First a confession. I am by no means an expert on networking technology. By which I mean to say that I don't know much about category 1, 2 or 3 copper cables, digital subscriber lines, long reach Ethernet or 780nm LaserBit wireless. I have, however, spent some time over the last two years in peoples houses, offices, and even their cars, talking to them online and monitoring chat rooms and bulletin boards, learning about how all kinds of people use, interact with, and adopt new technology. And since we're talking to a mainly broadcasting audience here, we will focus on the domestic

market.

In 1986, Arun Appadurai edited a collection of papers called 'The Social Life of Things' [4]. In this work, authors examined how physical commodities were socialised and made meaningful through being traded and consumed. Few of us would deny the social importance of certain types of material culture, say gifts in our society, but technology often seems to remain in its own abstract sphere, determined by futuristic notions of 'progress', divorced from socially generated meaning.

More recently, however, a series of writers and

thinkers have started to talk about 'The Social Life of Information' [5] or the social life of technology [6]. These authors have started to look at technology adoption in the context of why people take up innovation and, often more importantly, why they do not. As Seely Brown and Duguid note, it is often the 'attention to stubbornness, to what will not budge' (2000: 4) that is most revealing for designers. What I'd like to share with you today is an overview of some of the findings I have gathered over the last six months about the relationship between people, their computers and their televisions.

Socially constituted devices

Make no mistake, devices and software tools have social lives. Next time you see someone alone in a bar, notice how their mobile phone becomes a virtual companion, a surrogate for the person they are waiting to meet and a symbol of their connectedness to the outside world. Mobile phones are not successful because they are smart

tech. They are smart tech but the device is successful because it became embedded in the social fabric of late 20th century life practices

Since the early 1950s Television has done a great job of ingratiating itself into the hearts of users around the world. But it wasn't always that way. In the 1940s, TV was a technical curiosity that

was not seen to have any great future as a mass media. In 1926, Lee DeForest predicted that TV would never take off as a commercial proposition, dismissing it as 'a development of which we need to waste little time dreaming' [7]. It took the coronation of a new Queen in the UK to drive TV adoption, and in the US, the plight of a little

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"In the 1940s, TV was a technical curiosity that was not seen to have any great future as a mass media"

girl trapped down a well.

Some of you will be familiar with the Kathy Fiscus story but it is worth outlining here as an example of what I'm going to call an adoption event. In 1949 in California, Kathy Fiscus fell down a well. For more than 27 hours, Los Angeles viewers crowded around the few available TV sets in town to watch the drama unfold over what was probably the first live, local coverage of a breaking new event. By today's standards, this is unremarkable but as Terry Anzur of the University of Southern California points out, this event 'transformed television from a technical curiosity to a useful source of news and information and entertainment' [8]. This was the point at which TV started to get a social life.

This was also an early event in a process of acculturation, the transformation of Television into TV or 'telly'; a conceptual re-positioning from technology to household object. A similar process was going on in the UK when on the 2nd of June 1953, twenty million UK viewers tuned in to watch the coronation of Elizabeth II.

There are two important characteristics of both of these adoption events. First, neither was the result of a 'launch event', 'awareness campaign', or other execution of a marketing strategy.

Second, both were successful because they resonated so powerfully and personally with their audiences.

The second point here bears closer analysis. What caused audiences to respond so enthusiastically, and with such direct action? In the case of Kathy Fiscus, relevance was based on the local community's paternalistic concern for one of their own and illustrates some emerging trends in US culture at the time. We see not only the protectionism and paternalism of the late 40s but also some of the voyeurism, or at least the propensity for mediated culture that was to come much later. In the Kathy Fiscus story, we see the same social concerns represented in reality TV today and maybe in late twentieth century US mainstream Hollywood blockbusters.

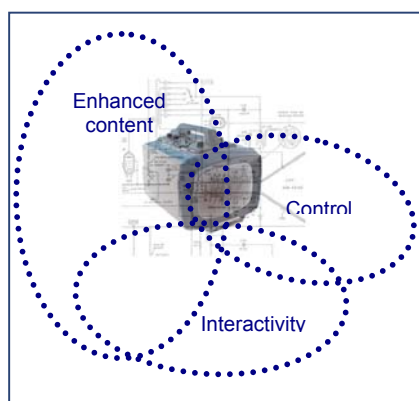
In the UK, resonance was ensured through different social dynamics. These included a long heritage of class-based social structure and practice, as well as the reverence for the monarch, amplified to almost divine proportions, in the context of post War Britain. Both events were grounded in social traditions, practices and ways of thinking that had been going on for decades, in some cases centuries. Raymond Williams has noted that a characteristic of modern society can be described

as 'a willed coexistence of very new technology and very old social forms' (1991:191). Perhaps technology adoption is about finding uses for new products in the old scheme of things. Think email as university post, bulletin boards as, well, bulletin boards, sms as informal banter in a world where everything else can be saved, printed and recorded.

TVs, for their part, have come a long way since these early adoption events and are now fully integrated into our social lives as entertainment devices, right where the 'wireless' used to be. Their integration is easily demonstrated by looking at the kind of connections TVs make, to the peripheral devices that help to define their functionality. In many households I have visited, the main TV comes with a suite of connected devices that use the screen in some way to deliver content or enhance that delivery. These could be as simple as a VHS recorder/players, DVD players, remote controls and surround-sound speakers – all non-networked devices that require insertion of physical media like tapes or DVDs.

Other TV peripherals can be more complex. The now near-ubiquitous set top box provides access to more ethereal media over satellite, cable or digital terrestrial signals.

"the transformation of Television into TV or 'telly'; a conceptual re-positioning from technology to household object"



Telephones have a long history of a slightly uncomfortable association with TV screens; first with home shopping and now with return lines over digital satellite or digital terrestrial channels (the association is uncomfortable because it interrupts another parallel use of that channel, that of personal communication).

And there are game consoles, currently ambiguous because their networking potential is mostly unrealised and because they have been so successfully brought into the family entertainment sphere by the efforts of Sony PlayStation. Today grown men justify the cost of € 299 for a PS2 because it's got a DVD too. The consequence being that it sits in the living room with the main TV, the older PlayStation or N64 going to secondary TV clients in the kid's bedrooms.

In the social life of Television, three dynamics are at work.

One concerns **enhanced content**. Surround sound speakers, wide-screens, VCRs and DVDs all work simply to provide more or better choices or to enhance the existing content that is being delivered.

Interactivity, a second dynamic, is generally provided over what is often perceived and marketed as a phone line, whether that phone line is a 56K modem or broadband cable (Kingston Interactive Television's Andrew Fawcett tells me that most of his customers don't know that they've got broadband, they just get 'more choice on the TV'.)

The final dynamic, **control**, is associated with one of the TVs oldest existing and now most ubiquitous peripherals, the remote, 'gizmo', 'zapper', 'clicker' or simply 'magic'. This innocuous peripheral is now so acculturated that it is not considered separate from the TV itself (many can't operate their

sets without it). What's more, it has been responsible for a major behavioral shift in how people use TVs. Since the first Venus 'Lazy Bone' appeared in 1952 [9] an early form of TV interactivity, channel surfing, has developed into standard viewing practice.

The interesting areas in this picture come where peripherals are ambiguous or flexible across one or more categories. Surround sound speakers may enhance the viewing experience but they don't stimulate the kind of hype that a PlayStation does, which is why home cinema has never taken off much, beyond being the domain of a few garage-addicts. Set top boxes and consoles, however, are an entirely different proposition because many are felt to promise both enhanced content and some degree of interactivity.

The myth of interactivity

"Minitel in France and Ceefax in the UK are two long-running examples of remote-to-screen text based interaction"

This provides me with an opportunity to dispel myth number one in the broadband stable. That is, that 'viewers need to be educated to interact with their televisions'. Like all myths, there is some truth in this and like all myths, unquestioning adherence to it parallels a drunkard's love for lamp posts, who, as Oscar Wilde pointed out, uses them not to light

him on his way but to cover up the fact that he's about to fall over.

On the contrary, I'm constantly amazed by the range and depth of people's interaction with their televisions. At a basic level, the remote is a fundamental form of interaction but there are much richer forms too. Minitel in France and

Ceefax in the UK are two long-running examples of remote-to-screen text based interaction, one of which at least requires jumping streams to a telephone 'return path'. Watch someone fire up a PlayStation these days and notice how quickly they navigate through the menu screens, load memory from the flash card, and change the

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system settings, all that before ‘interacting’ with the ‘content’ of the game story. See how people use their VCRs to time shift viewing from passive to interactive mode. How impatient movie watchers skip the ads or the ten o’clock news, or how pre-teens pause, re-run and re-run scenes from Dr Doolittle. DVDs amplify this interactivity by providing multiple content streams, similar to the old CD Rom model. And finally, watch Millionaire, Big Brother, or, come to think of it, any major sporting event and see how text is used on screen in translucent placeholders, mirroring web or TV based interactive layouts.

“Interactivity is about choosing when, as well as where and how, I ‘interact’, and sometimes I just want to be left alone.”

That’s how comfortable we are with interacting and with viewing ‘interactive-style’ content. The way some TV execs talk about it you’d think people hide behind the sofa every time they see a ‘press the red button message’.

Of course, people are interacting with their Televisions and have been doing it for years. More recently, they have been interacting with digital streams in the UK at an astounding rate. Sky now claims that 86% of its Sports subscribers use Sky Sports Active [10] and the BBC has reported massive success with its Wimbledon, US Masters, and Walking with Beasts programming. Sure, people haven’t been eager to press the red button to manage their bank account online, but maybe that’s because the proposition sucks and frankly, they’d rather be watching *Pop Idol*.

What gets viewers most excited about TV peripherals are the TiVo or TiVo-like devices. These combine enhanced content, with interactivity and viewer control and it is control here that is the key. Interactivity becomes a burden to users if they

have to interact when they don’t want to. Interactivity is about choosing when, as well as where and how, I ‘interact’, and sometimes I just want to be left alone. TiVo allows viewers to control what they interact with and when. And what’s the first thing people always say? ‘You mean I can screen out the ads?’ Maybe it is time for a new model of advertising, but that’s another story.

These three modes of ‘watching TV’, enhanced content, interactivity, and control, provide an interesting template for thinking about development. They alert us to the fact that looking out for areas where we can enable people to combine modes can be a useful design tool. But as an illustration of the social life of televisions, they also provide a comparative behavioral map of how we use TVs. So, can we do the same thing for PCs?

‘Personal’ computers

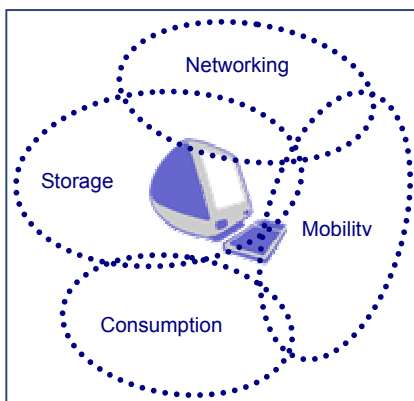
PCs are clearly a much younger technology than televisions. They are also much more thinly adopted into household social contexts, originating as they do in the world of work and necessity. The key adoption event for the acculturation of PCs into homes has been the creation of the world wide web in 1994 by Tim Berners Lee. Before that,

PCs were work based devices, if present in a domestic context primarily as a home office machine with secondary uses as an educational and entertainment centre. Only recently have PCs become ‘multi-media’ and only recently have they become networked.

Progress however, has been shockingly fast.

Common sets of protocols, from TCP/IP to USB have allowed PCs to become connected with each other and with a whole host of peripheral devices. These now typically include, printers, DVD, CD, scanners, digital cameras tuner cards and PDAs as ‘terminal devices’ and with other computers or networks, modems and

"In becoming personal, computers have absorbed the peripherals around them..."



mobile phones as connected devices. When we look at our PCs now we tend to forget the client-server, terminal based access systems, such as Unix or Vax that most of us here knew when we were at University. In fact, if you've ever installed Linux or administered a Unix system, you will have an indication of what peripherals (hard and soft) have been incorporated into the Personal Computer from the old client-server model; user-

customisable accounts, hard drives, floppy drives, CD drives, Ethernet cards, software modems - even the Graphical User Interface was an add on under Unix [11]. In becoming personal, computers have absorbed the peripherals around them as they have been adopted and adapted by the societies that use them. The DVD drive is fast going the way of the TV remote, it's becoming essential.

Despite this structural

similarity in the modes of adoption, the dynamics of the two device universes are quite distinct, at least for now. The way that people use the TV device complex suggests dynamics of enhanced content, interactivity and control, as we have seen, but PC use suggests dynamics of **storage, networking, mobility and consumption**. So far the only signs of convergent behavior are around the consumption dynamic for PCs, which maps onto the enhanced content dimension of TVs.

Social screens

Suggestions of non-convergence also come from the social context in which TV and PCs are used. When you walk into someone's living room, the TV is, more often than not, set up as the centre of focus. It is usually sited on a stand, surrounded symmetrically, if possible, by its suite of peripherals in an almost fetishistic display. These devices are central to the main living room of many houses and central to the families that surround them. On the other hand, the PC often sits underneath the stairs or in a separated part of the room, perhaps behind the sofa. Working on the computer is not something that family groups have their environments structured around.

In addition, TV viewing is

also an intensely social piece of behavior. Not only is it something that household groups do physically together, it is often something that provides a shared context away from home. A few years ago, I was in a group with several construction site workers at a lunch break. A conversation was going on about some people who they all seemed to know and it took me quite some time to realise that they were discussing a soap opera.

Another obvious difference here is that TV is associated with leisure and PCs are associated with work and necessity. The combination of PCs work emphasis and its private bias makes PC ideal for things like retail banking. Watch the

people in your office, the ones that are in unusually late or early are the ones managing their accounts online. Nobody wants to do this at home with the family watching, as many retail banks in the UK are currently discovering.

Finally, there is the whole media technology issue. TVs are so well accepted that they are not even thought of as technology any more. Any technology is completely transparent and the audience just sees content or media. Contrast this with the crash-prone, hack-susceptible PC environment and a huge difference emerges. PCs are a technology that obviously mediates content, TVs are invisible.

In fact, the point where these devices are turned

“A TV...becomes invisible when switched on...”

on or booted up, marks the gulf between the two. A TV, visible as a household icon, surrounded by its status laden suite of peripherals, assuming central prominence in the ‘living’ room, becomes invisible

when switched on. The technology of the PC, on the other hand, hidden under the stairs or desk, becomes visible only when booted up, as it starts to deliver unpredictable messages, run scandisk or virus

check, and do all manner of unnerving things. This logical inversion of TV and PC mirrors the associated structures of play and work, home and office, media and technology and provides support for the difficulty of TV-PC fusion.

The myth of pipes

Returning to the mapping on of content and consumption leads us to the second thread of the discussion on ‘Will TV replace the PC?’ Earlier, we noted that this question implies a confusion of channels, devices, technologies and agendas. Of particular interest to us is the confusion of device and channel. What has permitted this fervent competition between PCs and TVs, previously non-aggressive partners in the human mindshare race, is not anything new to do with the device *per se*, it’s all to do with the type of content they provide and is consumed through them. And that is all to do with fatter pipes: for us, broadband.

Myth number two, or as McKinsey & Company would have it, ‘long cherished belief...’ [12], is that broadband would bring about the fusion of TVs and PCs into a single device. As we have already seen, PCs and TVs are unlikely to merge anytime soon because

they are comprised in such radically different forms of social practice, having disparate social uses. However, what about the specific role of content consumption? Could there be a broadband facilitated form of convergence in this area?

To examine this, let’s look at one of the major broadband adoption events of the last three years. There has recently been a discussion about the so-called broadband killer app on the Slashdot community, and with the usual incisive disregard for commercial sensitivities exhibited by ‘slashdotters’ [13], two of the key suggestions were ‘pr0n’ (sic) and Napster/Gnutella.

For the purpose of this discussion, I’m going to focus on file sharing networks like Napster, Gnapster, Limewire, Gnutella, Bearshare, and their clones. The argument that these apps are the killer apps of broadband has a lot of

merit. They may not have invented it but the music industry first publicised, and then attempted to destroy, the most influential broadband adoption event so far.

It is currently fashionable to dismiss P2P networks as home to black hats, phreakers and crackerz (or worse, perverts), but this perspective is both mistaken and pernicious. Far from being the preserve of a few lawless über geeks, Napster was the fastest growing community in the history of mankind, attracting over sixty million users in the first two years of its original incarnation. When Napster was closed down in August 2001, MP3 downloads rocketed to three billion, far surpassing anything achieved by Sean Fanning [14].

Watching people use Napster in Europe was an amazing phenomenon. One young woman I did some research with illustrates a lot of the general behavioral

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patterns; we'll call her Amy for the purpose of this. When I knew her, Amy was a 28 year old single office worker who used her company's corporate LAN and PC to access Napster. Sometimes she would also use storage space on the company server to cache her MP3s.

One thing I found interesting about Amy, and that I have come across since, was that she often downloaded copies of the tracks she already had at home, as a means of 'time-shifting' her music collection. Sometimes she would experiment with new artists and be more exploratory but I would say that roughly two thirds of her cache replicated her CD rack at home, or old vinyl that was tough to get on to MP3 anyway.

Amy didn't bother having a portable MP3 players or ripping the tracks onto CDs for consumption later. She used the corporate pipe as a means of compensating for the fact that she didn't have access to her home collection. For Amy, this ability to make the music she loved mobile was the main value of the corporate broadband pipe.

This and many other semi-illicit downloads of its nature were executed over corporate LANs, home dial-ups not having the bandwidth. A company I worked with recently had forty employees and about

10Gb of MP3s on the file server; that's about one album per person. Just as in the case with Kathy Fiscus and the TV, Napster made broadband real for Amy, and for others, or as DeMorganLaw from Slashdot puts it,

Napster and its successor Gnutella have provided broadband users the ability to really use their bandwidth [15].

Amy wasn't into technology at all, she was a music fan. Like her, before Napster, few people knew what broadband was, even fewer than today. Most users didn't even know they had a 56Kbps modem, let alone understand the benefits a 256Kb pipe would bring them. But then, for the first time, people knew what broadband was for and it was transformed from an abstract technology into something really useful – free music.

Of course, that was just the beginning. The really interesting thing that is now happening is that the content you can download over file sharing networks has become much more diverse. Last time I looked, the music and pornography was sitting comfortably alongside the whole gamut of the usual net detritus. Free software, home video clips, movies, jokes, software licenses, game walkthroughs, hints,

cheats, cracks and copies of Windows XP.

In the future, we are likely to add more content, some legitimate, some not, and everything in between. Our households will become networks of connected devices that fulfill the consumption requirements we place on them – quality music, video, information, books, and a whole host of media we don't yet understand, all demanding different devices of varying degrees of visibility, complexity and interoperability. Why pay for another super-networked TV/PC hybrid when all you want is a screen in the office to run Excel spreadsheets, or a digital tuner in the kitchen that allows you to surf the net for digital radio stations?

At the heart of this myth is a misconception that 'content' is somehow uniform and unified. But in reality, 'content' comes in many different shapes and sizes. Some is public, some for private consumption only, some visual, some aural, some you watch as entertainment, some just does a job in the background, and the way that people interact with the categories content produces establish shifts them even more. Just look at the access devices people have in their homes right now – none of these show any signs of wholesale convergence.

“a whole host of media we don't yet understand, all demanding different devices of varying degrees of visibility, complexity and interoperability ...”

"TVs will not replace PCs and more that PCs brought about the paperless office."

To imagine that a 'one-size-fits all' super device will negate the need for all others is simply naive. Far from bringing about the

convergence of devices, broadband will encourage a proliferation of access devices, just as movable type brought about a

proliferation of print formats. TVs will not replace PCs and more that PCs brought about the paperless office.

Digital divisions

The final question left to ask is, 'if the access devices will not converge, will broadband supply become more unified?' However, the indications from early adopters are that even broadband services themselves will not be unified. Glancing over the Slashdot discussion groups [16] again reveals a range of requests for different levels of service but no lack of demand.

There is demand enough to go around. The Internet has become an integral part of both businesses and homes. Any self-respecting (desk jobs, at least) business will have an always-on connection today (pommaq).

I know more than a few people who'd kill for a persistant connection it doesnt even really have to be 'broad'band' (iomund).

Demand, as far as I can tell, has not slipped. Availability is the problem. I would sign up right now, if only DSL or cable were offered here. This is true for my co-workers and some of my neighbors (Dirty Sanchez King).

For one thing, those that are lucky to qualify for DSL and have the service, never want to give it up, unless of course the next thing is faster (Iyapunov).

But there is plenty of frustration. Early adopters can't understand why companies are so far behind.

If you can't make money providing a simple service to customers who will pay you \$50 a month and be happy if they can just get their porn, well you're dumb...When these companies fail, it's not because people don't want the product - it's

because of poor management. Management that couldn't see the eventual downturn in Internet companies was coming, management who thought \$2M super bowl commercials, where most of the viewers weren't actually in the service area, were a really good idea (Captain Super Boy).

You can count on it that these guys at Slashdot are not interested in bulk subscription packages with bundled in services and 'two movies free a month'. All they want is a fat pipe and a shell account, and they are your early adopters.

What will work for broadband is a range of services and options that will be flexible enough to meet the needs of micro markets, rather than the one-size-fits-all roll outs that we are currently seeing.

Conclusions: room for everyone

The future I have painted in this paper is not one of solid realities, simple business models and one dimensional value networks. It is not one in

which the TV wins against the PC or vice versa. A year ago, I was lucky enough to be working in the music industry in San Francisco, where we used

to loudly proclaim that the album was not a format invented by God. Well neither are PCs or TVs.

Talking about PCs and

“what will emerge from the unholy union of TV, PC, mobile phone, PDA, internet, and broadband?”

TVs as if these were Linnaean binomial categories is at best a crude model of reality. What's more, it denies the basic fact that these categories are dynamic, fractured, even fractal. They are little more than temporary responses to human wants, given the historical processes of technology development, the economics of production, and the vision of their creators.

The world of Sci-Fi often generates much richer concepts. William Gibson's works are full of surgically implanted

cranial network jacks ('Microsofts') and networked personal avatar projection devices ('Sandbenders' in one case). Neal Stephenson details displays that project onto your retina or nanotechnological 'always-on' smart-books; part encyclopedia, part storyteller, part interactive ('ractive') real time performance.

The real world is hardly any stranger. Bill Gates' company, terrified by the imminent demise of the personal computer, thrashes to dominate the network itself, or mobile computing, or now,

broadcast media. Sun is developing thin desktop clients on a Unix-like network and IBM and Xybernaut are developing wearable PCs. The question is not so much, 'will the TV replace the PC' but 'what will emerge from the unholy union of TV, PC, mobile phone, PDA, internet, and broadband?'

In the future there may not be any TVs or PCs. The reality is likely to be much more exciting.

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- ¹⁶ <http://slashdot.org/article.pl?sid=01/10/13/0853210&mode=thread>

About us...

The members of the Idea Society share a vision to stimulate progress through the power of collective genius. The purpose of The Idea Society is simply 'to share

great ideas'.

We stand for the free creation and exchange of ideas and believe that ideas have impact only when they are shared.

Our core values of Collaboration, Integrity, Freedom, Curiosity, Creativity and Sharing come from this belief.