

Design is certainly valuable as a forecasting tool, but we should not rely solely on predictions of technological progress when mapping future developments, argues **John Thackara**

Putting the future into perspective

The RSA's Design Directions award scheme has always asked entrants to look at the bigger picture. The recent addition of projects that use design as a vehicle for debating the pros and cons of technological advance and development – Intelligent Infrastructure Systems, and Horizon Scanning, for instance – further challenge young designers to think about the context, not just the artefacts, of daily life. These new categories stretch time horizons, too. The payback on infrastructure investments is calculated in decades, not years, so its designers must think long-term. Horizon scanning looks even further ahead. As usually practised, it searches far into the future for challenging visions that may influence policy decisions taken today.

This addition of future-based challenges sets Design Directions apart from the 'Design a CD rack' genre of design competition. However, there is a danger, in my view, that the competition and its entrants' scope of work will be constrained by the narrow worldview of these programmes. Horizon scanning looks far into the future, but it does so through a telescope that looks only for developments in science and technology at the expense of other, equally rich dimensions of life.

This is not to argue that we should stop looking for new developments. Designers are great hunter-gatherers of ideas and should be encouraged to develop that role further. But we should not just look ahead in time and not just look for technology. In particular, we should look to nature for inspiration – it has been innovating for three billion years. We should also learn from other cultures beside western ones. And we should learn more from the here and now. Inspiring things are happening just outside the door.

What is horizon scanning?

In its own words, the Horizon Scanning Centre is "strongly informed by the science base" – and four photographs on the Centre's homepage underline its remorselessly optimistic attitude towards

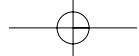
technology: a narrow-beam radar display; two people standing back-to-back, peering through binoculars; the moon, adrift in space; and a rainbow.

One of its recent projects, Intelligent Infrastructure Futures Towards 2055, reflected this mindset in practice. Sir David King, chief scientific adviser to the government, who leads the project, said at the time that it would set out to examine the challenges and opportunities for the UK in bringing 'intelligence' to its infrastructure – the physical networks that deliver such services as transport, telecommunications, water and energy. In particular, the project explored how, over the next 50 years, we can apply science and technology to the design and implementation of intelligent infrastructure for robust, sustainable and safe transport, and its alternatives. And so it did. Fifteen 'state of the science' reviews looked into such topics as pervasive tagging, sensors and data collection; delivering information for the management of infrastructure; intelligent distribution and logistics. Other sub-groups studied social, environmental and sustainability factors in future transport.

The final report is a fascinating read. Rather than say, "this is what will happen" (or should happen), it includes four contrasting scenarios of life in 2050. These were developed to help readers of the report understand the different ways in which 60 key drivers of change might play out over the next 50 years. The scenarios range from 'Perpetual Motion', which describes a still-accelerating world in which all infrastructures work seamlessly together, to 'Tribal Trading', which is about what life might be like when our growing economy overshoots its carrying capacity, degrades its resource base and collapses. The latter reads like a film treatment for *Bladerunner*: "After a sharp and savage energy shock, the global economic system is severely damaged. Infrastructure is falling into disrepair. Long-distance

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Illustration: Sonnet



travel is a luxury few can enjoy. For most people, the world has shrunk to their own community. Cities have declined and local food production and services have increased. Local transport is typically by bike and horse”.¹

If the scenarios have a weakness, it is in describing as hypothetical futures, changes that are happening now. For example, the report speculates that “perhaps in 50 years there could be a Department of Intelligent Infrastructure” – but in FedEx and DHL, we have just such organisations today; they’re just private. Another section refers to “growing resistance in 2040 to 24/7 working patterns”. But growing disaffection with that lifestyle is already evident in numerous happiness surveys.

Looking west

The Horizon Scanning Centre’s worldview is not uniquely British. On the contrary, its list of science trends to watch has been compiled for it by the Palo Alto-based Institute for the Future (ITF). ITF’s technological optimism leaves no room for nuance, or doubt: “We’ll not only genetically re-engineer existing life, but actually create new life forms with purpose”; “We will dramatically alter, enhance, and extend the mental and physical characteristics that nature has dealt us [and] begin to define different ‘transhumanist’ paths”; “We will remake our minds and bodies in profoundly different ways...[in an] evolutionary leap for humanity”.



The ITF to-do list goes on to state that objects will evolve fast, too: “Groups of smart objects will co-operate, often on an ad hoc basis, to augment human decision-making and, increasingly, to make decisions for us. Some believe that the next 50 years will witness the emergence of machines with supra-human intelligence.”

ITF’s manifesto for the UK’s future scanners resembles Victor Vinge’s concept of ‘singularity’.² In 1993, Vinge, a writer and mathematician, predicted that “within 30 years, we will have the technological means to create superhuman intelligence. Shortly thereafter, the human era will be ended.” In 18 years, we humans will cease to be the dominating force in scientific and technological progress and will be replaced by *posthumans*. If the ITF hesitates to embrace the ‘singularity’ explicitly, it is probably for marketing reasons. When ‘it’ happens, “all models of change based on past trends in human behaviour will be obsolete” – and so would be ITF’s core business.

It sounds superficially modern, but this worldview is a curious amalgam of 1990s tech-boomery and sci-fi in the style of *The Matrix*. British horizon scanning may have been delineated by a Californian (Vinge), but Europe remains just as in thrall to tech-based visions of the future. Most European member states have Foresight and Horizon Scanning operations. (Germany’s is called *Forschungszentrum Karlsruhe GmbH in der Helmholtz-Gemeinschaft, Institut für Technikfolgenabschätzung und Systemanalyse* – or FZK-ITAS to you and me). The European Commission also has its own programme, the Institute for Prospective Technological Studies (IPTS) in Seville. Faced by this proliferation of overlapping foresight activities, IPTS recently attempted to provide the commission with an integrated view of technological futures in a project called Fistera.³ The idea was to develop cross-national visions of the future of technologies and so lend coherence to priorities within the European Research Area (ERA). But a communiqué about Fistera’s results could as well have been written in California: readers were told that “Innovation is proceeding at an astonishing rate” and “researchers confidently predict [sic] that by 2020 the capabilities of machines will exceed those of humans”.

Can do; should do?

All this matters for design because there is a growing demand for ‘design-led futures’ – and those futures are being described exclusively as technology-based ones – whether they add value or quality to our lives or not.

Some leading designers have too readily adopted the can-do language of Big Science. Bruce Mau’s tour de force *Massive Change*, for example, is filled with confident assertions that “we will eradicate poverty”, “we will create urban shelter for the entire

world population” or “we will build a global mind”.⁴ Another design-futures phenomenon, WorldChanging⁵, is also resolutely optimistic. Asserting up front that “we don’t do negative reviews”, the WorldChanging website is inspired by the motto “Another world is here”. Working from the premise that “the tools, models and ideas for building a better future lie all around us”, this superbly edited site links together many people who are working on tools for change, but whose work remains unconnected; “we only need to put the pieces together”.

A can-do approach is admirable. *Massive Change* and Worldchanging are not old-style tech pushers so much as innovation and creativity pushers. But they take it as read that innovation leads to good, and seem unconcerned that can-do, when practised as well as preached, is the exercise of power. Unchecked, however, can-do implies “whether you want me to or not”. In asserting that “another world is here”, the implication is that the old one, which the rest of us inhabit, needs to be swept away. And the sweeping away will be carried out by an emerging design elite that feels like something Ayn Rand might have created.

This is why horizon scanning needs to be balanced by a discussion of what we *should* do – a topic missing in Californian *tabula rasa* techno-futurism.

Age concerns

The issue of ageing is a good example of how trend watching can lead to oppressive forms of innovation. One of the greatest human achievements – the addition of 20 years or more to the average life span in the space of three generations – is perceived by governments to be a problem, not an opportunity. One of the Foresight programme’s campaigns has been to alert business to the looming impact of the age shift on their markets, inspired by the realisation that the potential market for services that will enable us to live independently as we age is vast.

Some can-do businesses have begun to investigate the potential of new markets for services and products that will provide a better quality of life for frail or disabled older people. The government has offered to help by supporting research related to their needs – especially assistive technologies and in facilitating the transfer of these technologies from the universities to the business sector. Biomedical research, focused on the prevention of dependency in later life, and research into assistive technologies are both being lavishly supported.

Unfortunately for old people, and those of us who soon will be old, the majority of product and service innovation treats elderly people as passive recipients of ‘ageing in place’ technology. Intel, for example, is exploring “proactive computing applications that could assist the ageing in the digital home environment”. Tiny sensors or ‘motes’

RSA Design Directions 2005/2006 – Horizon Scanning

The award for the Horizon Scanning category went to Michael Smart, a third-year student of Design for Industry at Northumbria University.

His interpretation of the Horizon Scanning brief was to look at future uses of technology and their potential impact on us and on our lives.

“The increasing popularity of documenting our lives online, that is to say blogging, was of particular interest to me. By May 2006, online friends network MySpace.com had registered more than 20 million profiles and was adding 75,000 profiles each day. Many of these people are regularly sharing information about themselves and interacting with other users in a digital environment.

“This made me think about what would happen if our online blogs were made available in real time and linked to our real-life selves,” says Smart. “It is plausible that, in future, new and advanced technologies will enable us to overlap real life with digital information in this way.”

Examining the relationship between our lives online and in reality, Smart discovered that a certain amount of overlap was already taking place. He found a case in Korea where a man was murdered in real life as a result of something he did in an online role-playing game.

“I also looked at how various people, such as your mum or your boss, would view you in light of additional information being made available to them. It would not be possible to manipulate the way in which different people viewed us on the basis of the same hard data, in the same way that we can with our real-life selves.”

Smart was keen to be realistic about all possible implications of such developments and looked at potential good and bad scenarios.

“The positive examples are all about encouraging more interaction between people. To be able to share information about ourselves without having to approach each other physically and start a conversation removes the barrier to social interaction.

“The negatives are obviously to do with people using the information available for malicious purposes. Also, if you are sharing information about who you are and who you are friends with, there is the possibility, in the future, that you will be judged on your popularity so that people are driven to make as many friends as possible. This brings into question how meaningful such friendships would be.”

Smart was awarded a cash prize, which will contribute towards furthering his design education. He was also given three placements, with the Science Museum, the Design Council and the Horizon Scanning Centre, and an offer of Associate Fellowship with the RSA.

“The competition was a great learning experience. It allowed me to do research into areas that I would not explore all the time and consider areas of design I might want to work within.”



The visual element of Smart’s submission used images of real-life scenarios with MySpace bubbles above them to illustrate the sort of digital information that people might, in the future, be able to access about each other in real time

RSA Design Directions 2005/2006 – Design for Debate

Maria Araya, Shajay Bhooshan and James Warton formed the team that won the Design for Debate: Intelligent Infrastructure Systems category.

They are all taking a 16-month post-professional course in architectural design at the Architectural Association School of Architecture's Design Research Laboratory, which will lead to an MA degree in Architecture & Urbanism.

Each year, the Design for Debate competition brief focuses on the social, cultural and ethical impact of a different technology. In 2006 it focused on the infrastructure employed in the movement of goods and people and the application of information technologies and infrastructure to them.

"Initial explorations in swarms systems led us to investigate the application of these behaviours to the emergency response scenario," says Araya. "Our project focused on the infrastructure for emergency rescue in the City of London and how technological and scientific advances could enable a swifter deployment of services."

In order to apply their thinking to a real-life example, the team received information and support from an ambulance dispatch centre in Camden, north London. This opened a series of possibilities, one of the most significant being to use 'nested components' – for example, they proposed a bodysuit consisting of an assembly of various components that would form the emergency worker's 'work console' and allow him or her to work 'hands-free'.

"Our proposal was based on three main areas of research," says Bhooshan. "They were: the materials and technology available; the relationship between various public service providers patrolling London; and the relationship between the patient, technician and equipment."

"Although we were impressed by the complexity of medical equipment on ambulances, we were certain that they could be organised to better suit emergency rescues," says Bhooshan. "We spoke to ambulance staff and one area we found where there was room for improvement was that the driver currently has to get out of the vehicle to access any of his equipment. We looked at how this could be improved and proposed that we could pack some of the equipment actually on his body."

"We also looked closely at the space available in ambulances and the optimum space required for treatment of minor injuries, accidents and other 'emergency' victims," says Bhooshan. "We thought of ways to increase this by looking, for example, at the equipment needed – much is currently stored in ambulances." The group's research and discussions with ambulance crews suggested that not all the equipment was required in every vehicle and proposed to distribute various items among more than one unit in an equipment share, so that when the units came together for

a larger incident, they would have access to all the necessary equipment.

The team's other work included examining case studies of emergency responses, looking at the time it takes for an emergency call to be received, to be transferred to the central control room in Waterloo and then for an emergency dispatch vehicle to reach an incident and treat the patient.

They studied data on the existing volume of calls that the centre was receiving and explored ways to cut down the response time.



will be used "to gather both behavioural and biological data for customised proactive health applications... These sensors-based systems will enable adult children to assess the health and well-being of their ageing parents remotely through private, secure internet connections".⁶

Tech-based approaches to care are most advanced in Japan, where a research team recently announced a robot that can carry human beings and is "aimed at helping care for the country's growing number of elderly". The idea is depraved. Assistive technology (AT) is being promoted independently of whether old people want it or not. Tech companies and researchers reckon the market for AT can be worth tens of billions of pounds – not among elders, but among the children of old people who would rather pay for automated supervision than provide it in person.

Missing from this picture is an innovation process that is driven – and owned – by its intended beneficiaries: old people and their carers and communities.

Managing expectations

For techno-futurists, the inevitability of ageing and death is old-paradigm thinking. When can-do meets don't-want-to-die, their promises about technology become more exaggerated. In 2002, über-futurist Peter Schwarz, founder of the Global Business Network, told Hari Kunzru that knowledge from the human genome project, and the drug treatments and gene therapies it will bring, will lead to a massive improvement in health and longevity. "You and I have a shot at 150", he told Kunzru. "Our kids may live for centuries."⁷

Just two years later, in 2004, a paper by two research scientists entitled 'The Myth of the Biotech Revolution' pleaded for a more realistic assessment of the biotechnology industry and what it can deliver. "Many expectations about the impact of biotechnology are wildly optimistic and over-estimate the speed and extent of the impact of biotechnology," wrote the authors. The very existence of a medicinal 'biotech revolution' was questioned, they argued, by evidence that "outputs have failed to keep pace with increased research and development spending". Rather than producing revolutionary changes, as we

were being told to expect, the productivity of drug discovery was actually declining. "Medicinal biotechnology is following a well-established pattern of slow and incremental technology diffusion where major changes in technology take between 40 and 80 years to produce productivity improvements, and not any 'New Economy' revolutionary pattern of technical change."⁸

The trouble is that horizon scanning, when carried out mainly by scientists, has

a built-in tendency to ignore negative indications. Michael Schrage, a technology writer based at MIT, writes candidly that “these promises are indispensable elements of the innovation ecosystem. When artfully calibrated against actual progress, they keep markets salivating – and investment of both financial and human capital flowing.”⁹

Practised in this way, horizon scanning resembles marketing rather than objective analysis. It is a superficial if seductive message. Writing in 1972 about what he then called ‘publicity’, John Berger observed that its “images never speak of the present. Publicity speaks in the future tense and yet the achievement of this future is endlessly deferred.”¹⁰

Thirty years later, in an article about ‘futurecasting’, Hari Kunzru observed that prediction and control of the future were the cornerstones of the ideology driving the dotcom bubble: “From the 1849 gold rush to the space race (orchestrated by West Coast aerospace companies), California’s history has been driven by a sort of techno-economic transcendentalism, a yearning for a New Jerusalem on the temporal (Tomorrow!) and physical (The West!) frontier... The effect of futurist fictions, projections and predictions has been to fuel our desire for a technology boom.”¹¹

Next horizon: the here and now

Horizon scanning does not have to be tech-fixated. The here and now is just as rich, and under-exploited. Biomimicry, for example, studies nature’s models and then imitates or takes inspiration from these designs and processes to solve human problems – for example, a solar cell inspired by a leaf. Biomimicry uses an ecological standard to judge the ‘rightness’ of our innovations. As one of the founders of biomimicry, Janine Benyus, puts it, “after 3.8 billion years of evolution, nature has learned: What works. What is appropriate. What lasts.” Biomimicry is a form of innovation based not on what we can extract from the natural world, but on what we can learn from it.¹²

Life sciences might deliver more on their implausible promises by looking more into nature than tech. Susantha Goonatilake, author of *Toward a Global Science: Mining Civilizational Knowledge*, points out that only 1,100 of 265,000 plant species have been thoroughly studied. Of these, probably 40,000 have medicinal or nutritional applications for humans. There are estimated to be up to 750,000 higher flowering plants in the world. Many of these have not been described botanically, but roughly 10% have been used in traditional medicine somewhere in the world.

Ethnoecology, the study of indigenous ways of using local resources, could be far more cost-effective than hi-tech biotech. Forest-dwelling

peoples classify and use 99% of the rich biological diversity that surrounds them – whereas entire forests are devastated by western interests to exploit less than 2% of the available species. Classical writers in Ayurvedic medicine advised doctors to consult forest people about useful plants and drugs. The same methodology can be used by drug companies today.

Horizon scanning would yield richer results if it looked more into different cultures, too. The first major industry, textiles, owed a great deal to the transfer of knowledge from India. Cultural scanning can yield new ways of thinking about modern issues, as well as practical benefits. A fertile seed bed of ideas and metaphors exists in the South Asian tradition. Buddhism, for example, encompasses many powerful metaphors for thinking about systems and their behaviour through time. Goonatilake says: “The concept of *samsara*, the flow of life across time is one such. In Buddhist thought, change and process, which so perplex people in the west and north, are considered the essence of life.”¹³

A focus exclusively on technology is not smart. The most important innovation today focuses on the transformation of working practices – for example in the NHS. The next horizon is people and they are standing right in front of us.

1. www.doorsofperception.com/archives/2006/03/life_after_over.php
2. en.wikipedia.org/wiki/Technological_singularity
3. fistera.jrc.es
4. *Massive Change*, Bruce Mau and the Institute without Boundaries. Phaidon (2004)
5. worldchanging.com
6. www.intel.com/research/exploratory/digital_home.htm
7. www.harikunzru.com/hari/futurecasting.htm
8. ‘The myth of the biotech revolution’, Paul Nightingale and Paul Martin. *TRENDS in Biotechnology*, Vol 22 No11 (Nov 2004)
9. www.techreview.com/read_article.aspx?id=13808&ch=infotech
10. *Ways of Seeing*, John Berger. Penguin Books (1972)
11. *Ibid* 7
12. www.biomimicry.net/intro.html
13. *Toward a Global Science: Mining Civilizational Knowledge*, Susantha Goonatilake. Indiana University Press (1998)

Further information

W For up-to-date information about RSA Design Directions, please visit www.rsadesigndirections.org.uk

The Foresight Programme of the Office of Science and Technology was set up with the aim of “making the future work for you”. The programme brings together senior representatives mainly from business, government and science to “look at what might happen in the future, and what we need to do now to secure long-term competitive advantage and enhanced quality of life”. In its Science and Innovation Investment Framework 2004-2014, the government further established a Centre of Excellence in Horizon Scanning. This cohort of intelligent people, with a variety of skills in science-based

W futures, has unequalled access to leaders in government, business and science. www.foresight.gov.uk